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WORKING PLAN

FOR

THE NILGIRIS FOREST DIVISION
1ST APRIL 1954 TO 31ST MARCH 1964

REFERENCE

BY

T. JEYADEV,
Working Plan Officer

Under the Direction of the Conservator of Forests
Working Plans Circle

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District Forest Officer,
Special Division for Reconnaissance and
Survey of Eroded Lands,
Palayamcottai.

REFERENCE

INTRODUCTION.

The last working plan for the Nilgiris Division was prepared by Sri C. R. Ranganathan, I.F.S. It was in force from 1st April 1938 to 31st March 1948. Though the plan lapsed on 31st March 1948, preparation of a working plan for the succeeding period was not undertaken in time, due to various reasons arising from the repurcussions of the World War II. Under separate schemes sanctioned from time to time, in order to meet the immediate needs of the day, the work in the Nilgiris Forest Division was carried on within the framework of the last working plan.

2. The Working Plan Division to prepare this plan was formed on 28th August 1951, with Sri N. S. Ayyanna in charge of the division. He started the field work connected with the preparation of this plan. He retired from service on 4th January 1952. Sri D. V. Nagaratnam, District Forest Officer, the Nilgiris, was in additional charge of the Working Plan Office from the date of retirement from service of Sri N. S. Ayyanna, till Sri T. Jeyadev assumed charge as the Working Plan Officer, the Nilgiris Division, on the afternoon of 2nd February 1952.

3. Sri T. Jeyadev, the author of this plan, commenced reconnoitring the forests of the division soon after the assumption of the charge of the Working Plan Division, The Nilgiris, and submitted on 24th April 1952 the reconnaissance report for the preparation of this plan. The proposals contained in the report, with modifications made by the Conservator of Forests, Working Plans Circle, had been approved by the Chief Conservator of Forests, Madras, and this working plan had been prepared in accordance with the report so approved.

4. This Working Plan apart from revising the provisions of the last working plan also includes for the first time working plans for the Wattle and the Pyrethrum Working Circles. Pyrethrum and Wattle had been grown in the past only under piece-meal schemes sanctioned from time to time. This Working Plan deals with the entire tract covered by the Nilgiris Forest Division as at present constituted, and contains prescriptions and suggestions for the various forest operations to be carried out in the division.

5. Sri K. T. Mathew, I.F.S., Conservator of Forests, Working Plans Circle, directed the preparation of this plan throughout the period of preparation of the plan. His advice and guidance had played a great part in the shaping of this plan.

6. The Working Plan Officer was assisted by Sri N. Venkataraman and Sri K. James Paul, Working Plan Range Officers, in connection with the field work and collection of statistics. Seven foresters, namely, Sri O. Gopalan Nambiar, Sri C. V. Gopalakrishnan Nair, Sri G. Philips, Sri E. Sankaran Nair, Sri P. K. Sivasankaran, Sri K. M. Thomas and Sri K. V. Viswanatha Gowd had been engaged in the field work connected with the preparation of this plan.

7. The author of this plan wishes to place on record his indebtedness and thanks to the various persons who had rendered advice and help in the preparation of this plan.

8. The Working Plan Division for the preparation of this plan was closed on 1st July 1953.

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WORKING PLAN FOR THE NILGIRIS FOREST DIVISION FOR THE PERIOD 1st APRIL 1954 TO 31st MARCH 1964.

PART I.

Summary of facts on which proposals are based.

CHAPTER I.

The Tract dealt with.

Section 1—Name and situation.

1. This working plan deals with the whole of the Nilgiris Forest Division and will be known as "The Working Plan for the Nilgiris Forest Division".

2. The limits of the Nilgiris Forest Division are practically the same as those of the Revenue district of the Nilgiris. Hadithorai reserve and a part of Kallur reserve of Coonoor taluk are included in the neighbouring Coimbatore North Forest Division. The Nilgiris Division is bounded on the north by Mysore, on the west by Malabar and on the east and south by Coimbatore district.

3. The Nilgiris Division falls between the latitudes 10° 1′ N and 11° 45′ N and the longitudes 76° 0′ E and 77° 15′ E.

Section 2—Configuration of the ground.

4. The tract dealt with includes four naturally distinct regions, namely, (i) the Nilgiri plateau, (2) the Nilgiri-Wynaad, (3) the Sigur plateau and (4) the outer slopes facing the plains. The nature of vegetation varies in each of the regions according to the configuration of the ground, its geology, soil and climate.

5. *The Nilgiri plateau.*—It is an extensive plateau, about 35 miles long and 20 miles broad, with an average elevation of 6,500 feet above sea level and is formed by a series of undulating hills and valleys upheaved at the junction of the Eastern and Western ghats of the Peninsula. It falls towards south and east to the plains of Coimbatore, on the west precipitously to Malabar and on the north gradually to a lower plateau which is geologically part of Mysore plateau. The Nilgiri plateau is divided east and west into fairly equal, but climatically dissimilar, halves by a range of hills running north and south and culminating in Doddabetta Peak (8,650 feet). The Doddabetta range shelters the eastern half of the plateau from the south-west monsoon and the western half from the north-east monsoon, thus giving them widely differing climatic conditions. Doddabetta is a familiar landmark from Ootacamund and it is the second highest point south of the Himalayas, the pride of the place in the Peninsula going to the Anaimudi Peak (8,840 feet) in Travancore.

6. East and south of Doddabetta range of hills, in the zone of the north-east rains, the country (except around Kodanad where the terrain is similar to the western half of the plateau) is widely cultivated by an immigrant type of people known as the Badagas. The original forest growth had been cleared and their place had been taken by cereal and potato crops, the latter having been very widely cultivated in the recent past. Where agriculture had been abandoned a miserable scrub is left largely consisting of *Rhodomyrtus tomentosa* and *Dodonea viscosa*. This forest denuded country gets badly eroded with every good shower of rain, and with the washing away of the fertile soil, very many great patches of reddish yellow clayey sub-soil have been left behind. The muddy waters of the streams that drains these slopes bear witness to the enormous erosion that is taking place. What had once been hailed as a country of aesthetic splendour is now bereft of vegetation and beauty, and the desolate sight is one to cause sore eyes to any casual beholder of the landscape. West of Doddabetta, however, the Badagas are scarcer, and the country consists of a mass of rounded grass hills, swelling here and there to prominent heights and ranges. Except for the clusters of little huts of the pastoral tribe of Todas, which lie scattered in the different "munds" of the grassy plateau, hardly a village or field is to be seen. Thanks to the reservation of large patches of such grassy areas in the past, not only had the land been effectively protected against inroads for cultivation and consequent danger to the soil, but also had helped to regulate the flow of waters to the tributaries of the Bhavani and the Moyar. It had also helped in the survival of the pastoral race of Todas, as otherwise the extension of cultivation and tea estates would have reduced the extent of pastures

needed for the Toda buffaloes, on which they eke out their livelihood. The reservation of large areas in this western region, where the catchment area, for the sources of the Hydro-Electric Projects of Pykara and Moyar as well as for the Irrigation Project of the Bhavani lies, had ensured satisfactory protection and supplies to the headworks of the projects. The rolling hills of this region are divided from each other by little streams or swamps, and in the folds of these hills lie gracefully the sharply defined little woods known as sholas. The rounded contours of their dense canopy and the varied and varying tints of their evergreen foliage against the background of grassy stretches are indeed a joy to behold. Apart from the sholas, most of the plantations of exotics like Eucalyptus and wattle are found scattered over the Nilgiri plateau.

7. The western edge of the Nilgiri plateau is formed by a range of hills called the kundahs. This range of hills rises steeply from the Silent Valley, the Nilambur Valley and the Ouchterlony Valley and constitutes an unbroken wall (except the Sispara Pass) rising frequently along its length to a series of elevated peaks most of which are over 8,000 feet high. The most notable of the peaks are Pichal Bettu (8,395 feet), Mukurti Peak (8,380 feet) and Nilgiri Peak (8,122 feet). A second inner range of hills running parallel to the outermost run of the Kundahs starting south of Devarabetta (8,303 feet) near Avalanche are including the high peaks Nariadu Bettu (8,362 feet), Kundikadu Betta (8,642 feet) and Kalari Betta (8,624 feet) apart from protecting the Ootacamund basin from the rigours of the western winds, produces a marked difference in the climate of the territories east and west of Avalanche. The outer Kundah range of hills and the parallel inner range protect the Nilgiris plateau from the violence of the south-west monsoon, causing a steep gradient in the rainfall from over 300 inches on the crests of these hills to about 60 inches on the protected plateau.

8. *Drainage of the Nilgiri plateau.*—The general aspect of the plateau is towards the east and the south. The plateau is drained by innumerable little streams which are beautiful and perennial. The vast majority of them fall eventually into the Moyar or the Bhavani. Since the Moyar itself flows finally into the Bhavani river at Peerakadavu on the Coimbatore plains, the Bhavani may be considered to carry the entire drainage of the Nilgiri hills. The Bhavani is an important tributary of the Cauvery, on which depends vast tracts of cultivation in the districts of Tiruchirappalli and Tanjore. Thus, the conservation of the forests on the Nilgiris which lie in the catchment area of the Moyar and the Bhavani is of vital concern as they regulate the water-sources for cultivation over a vast area and also for generation of electric power.

9. The network of streams rising from the Nilgiri plateau resolves itself into the following principal river systems :—

(1) *The Paikara river*, which rises as the Mukurti stream on the grassy slopes of the Mukurti Peak, receives from the east the Krurmund and Parson's valley streams and draining the extensive west of the plateau plunges down a steep valley by a series of falls, into the low country near Gudalur. Thence the river (thereafter known as Moyar) winds placidly to Teppakadu, turns sharply eastwards, drops over a considerable fall, passes through a narrow gorge, known as the Mysore Ditch and finally falls into the Bhavani. The Paikara is the biggest river on the plateau and is held sacred by the Todas.

(2) *The Billithada Halla*, whose catchment area lies on the slopes of the Kolari Betta, Kudikadu Betta, and Devara Betta forms one of the main sources of the Bhavani. The Billithada Halla moves unhurriedly through a narrow valley for the greater parts of its passage on the plateau and is one of the charming sights in the southern part of the plateau.

(3) *The Kundah river*, which rises near Avalanche carries the drainage of the Emerald Valley and the Nanjanad Valley, flows in a deep ravine separating the Kundahs from the rest of the plateau and eventually falls into the Bhavani in the lower part of the country, where it is known as the Manar River.

(4) *The Coonoor river*, which races down the ravine up which the Mettupalayam-Coonoor Ghat Road is carried, is principally made up of the Coonoor stream which drains the basin where Coonoor and Wellington are situated, and of the Kateri stream which rises on the Kateri and Ketti Valleys alongside. The Coonoor river joins the Bhavani at the foot of the ghat.

(5) *The Sigur river*, rises on the slopes above the Ootacamund lake, flows through the lake, joined further down by the Sandy-Nullah stream, rushes down the Kalhatti falls (170 feet high) to join finally the Moyar.

(6) *The Kedar Halla*, which rises near Ebbanad at the northern edge of the plateau is joined by the Kavithore Halla before it quits the plateau, flows past Anaikatti in Sigur range to fall into the Moyar.

10. *The Nilgiri-Wynaad.*—It is a lower plateau with an average elevation of 3,000 feet, lying to the north-west of the main mass of the Nilgiris. This working plan is concerned only with the north-eastern corner of the Nilgiri-Wynaad, occupied by the Benne and

Mudumalai forests of Mudumalai Range. This region has a higher rainfall and a much more luxuriant vegetation than most parts of the adjoining plateau, which lies within the Mysore State. The ground in this region is more or less undulating, raising gradually in the north to a low range of hills which runs east-west from Mannu Gudde near the Mysore frontier past Tenbarri Betta to Narati Betta (3,770 feet) on the boundary between the Nilgiris and Wynaad Divisions. This range of hills forms a water-shed dividing the barren forests of the Doddakatti block in the north from the more densely wooded Mudumalai block in the south of Mudumalai Range.

11. Numerous streams drain the Mudumalai forests. The main streams are (1) *the Moyar* which flows along the eastern boundary of Mudumalai Range, (2) *the Benne Hole* which drains the western part of the Range and flows west to join the Noolpuzha in the Malabar-Wynaad, (3) *the Bidar Halla* which drains the southern part of the range and flows into the Moyar and (4) *the Kekkan Halla* which forms the frontier between the Nilgiris and Mysore and finally flows into the Moyar.

12. The name Wynaad means the land of swamps. As the name implies a characteristic feature of the Nilgiri-Wynaad is the frequent occurrence of swamps of varying sizes at the foot of the hills. In the more accessible localities many of these swamps are cultivated for paddy. It is believed that the following conditions favour the formation of swamps in this region ; (1) the undulating type of the country without any pronounced direction of drainage, (ii) low hills with gentle slopes, (iii) impeded but not barred, drainage in various places, (iv) the presence of vegetation on the slopes to prevent rapid drainage and (v) an annual rainfall in excess of 50 inches. By the action of heavy rainfall the finer particles of the soil, in particular the clay colloids, are carried down to the foot of the hills where the movement of the water is very slow due to impeded drainage. The cumulative deposition of the fine particles of the soil tends to flatten the ground at the foot of the hills, thereby further retarding the free flow of water. The colloidal nature of the deposit gives the ground a permanently swampy character.

13. *The Sigurplateau.*—It is a narrow strip of country lying between the foot of the Nilgiris and the Moyar. The general elevation of the plateau is about 2,800 feet. Towards the west in the vicinity of Masinigudi, the ground is gently undulating, but east of Anaikatti the country becomes rugged, broken by numerous ravines and low ridges. The ground slopes to the north towards the Mysore Ditch and to the east gradually to meet the plains of Coimbatore. Though the general elevation is more or less the same as that of the Nilgiri-Wynaad because of the nature of the terrain (more gently undulating and less hilly) and the amount of rainfall (about 35 inches per annum when compared with an average of about 60 inches in the Nilgiri-Wynaad) swamps do not occur in this region. In fact this plateau includes vast stretches of arid tract not common in the other regions of the district.

14. *The Sigur Halla, the Kedar Halla* and *the Moyar* drain this plateau. These streams rise in the Nilgiris. The Moyar forms the northern boundary of Sigur range.

15. *The outer slopes.*—The slopes on the western side receive the full force of the south-west monsoon and they are generally precipitous, some of the higher regions being often a sheer rock without soil or vegetation. The eastern and southern slopes facing the plains of Coimbatore are less precipitous and present an altitudinal zonation of different types of vegetation.

Section 3—Geology, Rock and Soil.

16. The Nilgiri hills consists of a great mass of foliated gneissose rocks, of the class termed charnokite, with a few later dykes of olivine-norites, from an inch to ten feet width, which are well seen at Coonoor. It is believed that whole of the plateau had once been submerged by the sea. Not only does it consist chiefly of rounded hills and undulations which usually result from marine sections, but in several places escarpments may be traced which, though now partly cut up into ravines and round spurs by the denudations resulting from heavy rainfall, were apparently formed by oceans washing their bases. On the south-western side of the Doddabetta range, overlooking Ketti valley is one of those ; another occurs to the north and north-west of Wellington.

17. The faces of the cliffs have been altered as much by the heat of the sun as by the action of the rain. The weathering resulting from the alternate action of the heat and the cold causes splits in the outer layer of the rocks and during the rains landslips are caused by the action of water on the decomposed hill sides.

18. The fundamental rocks of the Nilgiri-Wynaad differ sharply from the Nilgiri plateau, being typical archaen biotite and hornsblendic gneiss, with intensive bunds of charnokite and much younger biotite-granite, pegmatite and basic doleric dykes. In some of the pegmatites good ruby mica of fair size occurs. A series of gold bearing reefs are known to occur across the Wynaad gneiss.

19. The soils of the Nilgiri plateau vary considerably in depth from a few inches to several feet. They may roughly be classified into four varieties : (1) the black soil, which is a rich loam and the best of all (the black peaty earth of the bogs, however, is useless until well worked with the mineral soil), (2) the brown soil which is a clayey loam and comes second best in productiveness but it often overlies a dry lateretic sub-soil, (3) the yellow soil which is a stiff clay and requires drainage and is often unsuitable for agriculture and (4) the red soil which is not so stiff as the yellow soil which often contains a lot of kaolin but is equally unproductive but of late with manuring large areas of red to brown soils have been brought under potato. All soils in the Nilgiri plateau lack in lime.

20. Two kinds of soils may be recognized in Mudumalai Range, a black sandy loam containing over 50 per cent sand and gravel, and a red heavy loam. The red soil is generally confined to the southern part of the range where the rainfall is heavier and carries much better height growth than the black. The texture of the blackish soil does not perhaps favour better retention of moisture and possibly it has more infertile mineral content in its body. The relatively poor type of soil and the lesser rainfall in the northern part of Mudumalai Range account for a dry deciduous type with poor height growth. In Mudumalai Range the soil moisture is higher in the western regions than in the east.

Section 4—Climate and rainfall.

21. The Nilgiri plateau has a temperate and equable climate. A statement showing the average temperatures of two of the important stations of the Nilgiri Plateau is given in Appendix I to this working plan. At Ootacamund the average maximum and minimum temperatures are 65° F and 49° F. At Coonoor the average is 6° hotter. Being a tropical plateau the low temperature is mainly due to the altitude and not latitude. The intensity of the solar radiation is very high and the daily range of temperature in the open is very considerable excepting during the monsoon period. Even in the shade, the diurnal range is about 22° in February and about 9° in July. Plant growth on the Nilgiris is alternatively exposed to the fierce glare of the noon day sun and the sudden drop in temperature that follows the setting of the sun. The absence of any indigenous conifers and of a subtropical type of vegetation as well as the difficulties experienced in the past to naturalize European species in the Nilgiri plateau may perhaps be partly attributed to the wide diurnal range of temperature. The lack of lime in the Nilgiri soils is probably another advserse factor.

22. The first three months of the year are almost rainless with a series of bright clear days during which a dry wind blows from the north-east through January and February and veers round to the south-east in March. Frosty nights are common from December to February. Thunder storms occur during April and May and south-west monsoon bursts during the middle of June and lasts till the end of August giving more or less continuous rains. The kundahs and the western part of the plateau receive heavy continuous rain whereas showers alternating with Scotch mist are common in Ootacamund and the inland parts of the plateau. With a break in the rainy weather, the north-east monsoon brings cyclonic rain towards the middle of September giving more rain on the Coonoor and Kotagiri side and lighter rain around Ootacamund. In November and December the skies are clear and ground frosts reappear around Ootacamund, while on the eastern side of the plateau sunshine and rain alternate until the close of the year.

23. The Nilgiri plateau is shaped like a wedge with its apex to the south and is so situated that it gets the benefit of both the monsoons. The western rim of the plateau generally and the north-eastern part of the plateau in the neighbourhood of the Rangaswamy Peak are the principal foci of the south-west monsoon and the north-east monsoon respectively. On the peaks of the western rim the rainfall exceeds 300 inches per annum. Near Rangaswamy Peak it is about 100 inches. The rainfall diminishes gradually towards the interior of the plateau. Nowhere in the plateau, however, is the annual rainfall less than 40 inches ; at Ootacamund it is over 50 inches and at Coonoor and Kotagiri it is about 65 inches. As the Doddabetta hills act as a barrier to the free movement of the monsoon winds, the plateau gets divided into two distinct climatic zones, the western part receiving the *principal* rainfall from the south-west monsoon and the eastern part from the north-east monsoon.

24. The climate of Nilgiri-Wynaad is comparatively temperate but warmer than the Nilgiri plateau, the shade temperature ranging between 55° F and 95° F. Excepting during the monsoon dews are common throughout the year.

25. In Nilgiri-Wynaad region the rainfall is mainly from the south-west nonsoon. The western and southern parts receive greater rainfall than the eastern and northern parts of this region. In the south-western corner the rainfall is over 100 inches per annum. At Benne the annual rainfall is 70 inches whereas at Kargudi which is 15 miles east of Benne the annual rainfall diminishes to about 55 inches. North of Jenberi Betta-Narati Betta Watershed the rainfall is very much less and the climatic conditions gradually merge with

the conditions prevailing in the Mysore plateau across the State frontier. The variations in the extent of rainfal within short distance in the limits of Mudumalai Range cause perceptible variations in the type and luxuriance of growth in the area.

26. In the Sigur plateau though the range of temperature is more or less similar to the Nilgiri-Wynaad, the humidity is considerably less as the annual rainfall in the area is less than 35 inches. Reflection of the heat of the sun from the Nilgiri hills facing Masinagudi part of the plateau makes conditions worse during the summer. The climate of the Sigur plateau ranges from dry in the western part to arid condition in the eastern part.

27. Moyar-Betta lying in the western edge of Sigur Range and the main mass of the Nilgiri hills shut out the south-west monsoon to a great extent for the areas in the northern and eastern parts of Sigur Range. Masinagudi has an annual rainfall of over 35 inches nearly two-thirds of it being received from the south-west monsoon while Anaikatti ten miles further east gets about thirty inches half of it from the north-east monsoon.

28. A statement showing the average monthly rainfall recorded at some of the important stations in the Nilgiris District for the past few years is given in Appendix II to this working plan.

Section 5—Water-supply.

29. The water-supply is generally satisfactory in the Nilgiris Division except (1) at Masinagudi where water has to be brought from the Singara four miles away or from wells within a radius of about two to three miles, (2) at Benne where the water is unwholesome, (3) at Kargudi where the water has to be brought from the Moyar up the hill for a distance of about two miles, and (4) at Anaikatti where the water from the stream has to be got over a distance of about a mile.

Section 6—Distribution and area.

30. The Nilgiris Forest Division is divided into five ranges. A peculiar feature of the reserved forests of this division is the multitude of reserves lying scattered all over the plateau. The reserves on the plateau number 405, whereas the total number of reserves of the division is 430. Many of them are too small in extent and lie isolated from one another.

31. Particulars of the severeal ranges as existing in the year 1952 are given below :—

Name of the range.	Headquarters.	Number of reserves.	Area in acres.
1 Ootacamund, North	Ootacamund	86	36,756·69
2 Ootacamund, South	Ootacamund	87	73,792·83
3 Coonoor	Coonoor	232	59,573·47
4 Mudumalai	Kargudi	9	59,458·98
5 Sigur	Masinagudi	16	83,595·13
	Total for the division	430	313,177·10

313,177·10 acres or 489·3 square miles.

32. Mudumalai Range is divided into four forest blocks : Teppakadu Block containing 14 compartments with an area of 17,993 acres, Mudumalai Block containing 14 compartments with an area of 20,408 acres, Benne Block containing 11 compartments with an area of 11,532 acres and Doddakatti Block not divided into compartments with an area of 15,972 acres. Compartments 13 and 14 Teppakadu Block lie to the east of Moyar and fall within Sigur Range, but their vegetation justified their inclusion in the blocks of Mudumalai Range for the purposes of compartmental division.

33. A complete list of reserves in the division and particulars of their notification are given in Appendix III to this working plan.

Section 7—State of the boundaries.

34. The boundaries of the reserves are cleared lines 12 to 18 feet wide, except where streams or rivers are utilised as boundaries. Rough stone cairns are placed along cleared lines at angles and salient points in the case of some reserves, but they are not in a satisfactory condition in most cases. In the case of many Reserves no clear lines of demarcation are available.

35. The inter-divisional boundary between the Nilgiris and the Coimbatore North Divisions is indicated by a cleared line 30 feet wide provided with cairns.

36. The outer boundary of Mudumalai reserves on the northern side where it merges with Mysore state boundary is demarcated by a cleared line 100 feet wide except where the Kekkan Halla forms the frontier line. This boundary was settled by a Commission of Madras and Mysore officials in 1897, when necessary pillars were fixed at six points named A, B, C, D, E and F. The boundary is in a fairly satisfactory condition.

37. The inter-divisional boundary between the Nilgiris and the Wynaad divisions runs over a distance of ten miles from Kaikatti on Sultan's Battery road to Maragaddi and is maintained by a set of guide lines with the exterior line burnt annually.

38. The plantations of the division are surrounded by six-feet lines which are scraped annually as a measure of fire protection. The scrapped lines serve to demarcate the plantations.

39. Owing to the great number of reserves lying scattered all over the plateau, the total length of the boundaries to be maintained is very great, and lapses in the matter of proper maintenance of the boundaries had often resulted in many petty encroachments, which have been dealt with from time to time.

40. The inaccuracies in the reserve boundaries of the division have been the subject of several investigations in the past. Verification of boundaries was undertaken departmentally in 1915 and 1918, but the work was left incomplete. Demarcation and verification of boundaries were resumed in 1924, by a special forest staff, but the comparatively trifling, though numerous, discrepancies brought to light were thought not to justify the very considerable expense which would be needed to set them right. And the work was abandoned.

Section 8—Legal position.

41. The reserved forests of this division are the absolute property of the State, subject to certain specified public rights and concession admitted at the time of settlement.

Section 9—Rights and concessions.

42. The various rights and concessions admitted at the time of settlement are stated in the *Fort St. George Gazette* notifications and reference to number and date of notifications and the pages of the Gazette are given in the list of reserves in Appendix III to this working plan.

43. *Lands leased to the Cinchona Department.*—In the vicinity of Naduvattam an aggregate area of 5,983 acres of reserved forest are in the possession of the Government Cinchona Department for the cultivation of Cinchona. The use of the lands by the Cinchona Department is regulated by the issue of an annual licence by the Forest Department. The lands so leased out comprise the whole of the Wood Estate included in the Naduvattam Reserve, a portion of Northern Hay and Singara reserves, a portion of Naduvattam reserve including the Cinchona Estate (Hooker's) and the whole of Devarmalai Reserve. Additions to this area were made in 1943 in an extent of 196 acres. The particulars are as follows :—

	ACS.
Ootacamund North Range.—Whole of Wood Estate in Naduvattam reserve, portion of Northern Hay and Singara reserves including Government Cinchona Estate and whole of Devarmalai Reserve.	5,787·20
Ootacamund South Range.—Devarshola North and South—G.O. No. 2335, Development, dated 21st September 1943.	195·61
Total ...	5,982·81

44. *Lands for Moyar Hydro-Electric Scheme.*—An area of about 420 acres in the reserved forests of Sigur Range had been placed under the disposal of the Hydro-electric Department in connection with the execution of the Moyar Hydro-electric project.

45. *Lands leased to Agricultural Department.*—An area of 26·1 acres in Sim's Park reserve is on free lease to the Pomological Gardens at Coonoor. In G.O. No. 1578, Development, dated 9th April 1951, Government have authorized the Agricultural Department that the lands placed at the disposal of the Pomological Gardens authorities may be used

by them subject to the condition that the lands will revert to the Forest Department in case the Pomological Gardens are abolished. The total area leased out so far is as follows :—

		ACS.
1	Area leased out in 1906	3·75
2	Addition as per C.C.P. Mis. No. 11, dated 8th January 1921	1·57
3	Additions as per G.O. Mis. No. 534, Revenue (Special), dated 15th March 1930.	5·28
4	Additions as per Government Memorandum No. 20284-III-385, dated 30th January 1939.	4·00
5	Additions as per G.O. No. 762 of 23rd February 1944	1·50
6	Additions as per G.O. No. 1849, dated 14th April 1948	10·00
	Total ..	26·10

46. *Lands leased to Sericultural Department.*—An area of 9·75 acres in Black Heath reserve in Coonoor Range had been given on free lease to the Sericultural Department. 5·4 acres in two bits were handed over in June 1950 as per C.C.P. No. 14237-49-C-4, dated 24th May 1950 and the rest of the area were handed over in March 1952. The growth in the land previous to the transfer was sold and the revenue realized credited to the Forest Department.

CHAPTER II.

THE FOREST.

Section 1—Composition and condition of the crop.

47. The forests of the Nilgiris Division contain a plethora of species, and though a small division in extent, most of the familiar types of South Indian forests are represented in it together with a few that are peculiar to the Nilgiris. In altitude the division covers from about 1,000 feet to over 8,000 feet above the sea level. Its annual rainfall ranges from 30 inches to over 300 inches. Both the south-west and the north-esat monsoons give rainfall to the division and the Doddabetta range of hills running north-south divide the division into climatically dissimilar eastern and western halves, the former depending on the north-east monsoon for its principal rainfall and the latter on the south-west monsoon. The temperature variation also is from hot at the foot of the eastern slopes to temperate on the plateau. Forests occur generally on the western half of the plateau, though locally in certain tracts in the eastern half. The Kodanad area in the extreme east, where the topography and the vegetation resemble those of the western plateau, is one such zone. Thus, the peculiarity of the climate on the Nilgiri plateau, which combines a high intensity of solar radiation, a wide diurnal range of temperature especially in the cold season, winter ground frosts and a rainfall varying form adequate to torrential, as well as, the varied climate and configuration of the slopes as the country descends down to the lower arid tracts are reflected in widely different types of vegetation with great diversity of plant communities varying according to the habitat.

48. Following the topographical description referred to in paragraph 4, the vegetation may be broadly divided into four different categories, namely : (i) the Shola-Grassland vegetation of the Nilgiri plateau, (ii) the moist deciduous and dry teak forest of Mudumalai Range in the Nilgiri Wynaad region, (iii) the open deciduous sandal bearing scrub of the Masinagudi-Anaikatti plateau and (iv) the forests of the outer slopes showing marked altitudinal zonation from thorny scrub to evergreen forests, especially on the eastern slopes. These broad categories of vegetation include various types of forests, their seral and edaphic modifications, with variations in floristic composition. Though it may be difficult to classify them ecologically into distinct plant associations, it is possible to describe the distinct types of forests included in them. In the description of the different forest types in the following paragraphs, wherever possible, the nomenclature adopted by H. G. Champion in his book on the 'Preliminary Survey of the Forests Types of India and Burma' (Indian Forest Records—New Series—Volume I, No. 1, Silviculture) had been used in order to be specific and uniform in the naming of the forest types. In addition to the natural types of vegetation referred to above, there are plantations of Eucalyptus, wattles and other exotics on the plateau and plantations of teak in Mudumalai Range. Small experimental plantations of sandal have also been attempted.

49. A note on the important panna in the tract dealt with is given in Appendix V to this Working Plan.

50. *The Shola Grassland vegetation of the Nilgiri plateau.*—The natural vegetation of the Nilgiri plateau consists typically of vast stretches of grassland interspersed with numerous isolated, compact, sharply defined and usually small woods consisting of stunted

evergreen trees, known locally as "sholas". According to Champion's classification of forest types the shola forests fall under the type "Southern Wet (Montane) Temperate Forests" (Group 10-A). The shola may be described as a high elevation stunted evergreen wood commonly occurring in the higher hills of South India (on the Nilgiris, the Anamalais and the Palni Hills) from about 5,000 feet and 8,000 feet. The shola is a closed evergreen forest, the trees being mostly short-boled, branchy and often strangling. The height of the forest is low rarely exceeding 50 to 60 feet. The crowns are usually very dense and rounded and consist of coriaceous leaves which tend to have varying degrees of red when young. The changing tints of their foliage with different seasons and the varied range of colours at any time of the year are not only of great beauty but also one of the most characteristic features of this type of forest. The branches of the trees are clothed with mosses, ferns and other epiphytes, and woody climbers are also common. There is no marked differentiation of canopy layers, but there is a continuous series from under shrubs to shrubs and shrubs to the larger shola trees. There is a great wealth of species in good admixture and pure crops of even moderate extent are rare. The shola is usually found in patches on the Nilgiri plateau in the more sheltered sites of the rolling grasslands. The proportion of the shola trees to the grassland areas in this type of vegetation would roughly be 1 : 4. On the western half of the plateau and in the neighbourhood of Kodanad in the extreme east, the extent of grassy lands are more when compared with the eastern half of the plateau which lies in the zone of the north-east rains and usually free from frost.

51. The climate in this type of forest is perhaps the most equable in India, the variation in the mean temperature of the different months of the year being about 10° F. The climate is conditioned by the montane situation well within the tropics combined with a well distributed rainfall from both monsoons. The annual rainfall in this type varies from 60 inches to 250 inches, but the relative value of the two monsoons depends on the situation and the degree of exposure. The mean annual humidity is about 70 per cent. Exposure to winds is an important factor in the development of these temperate evergreen forests and the effects of the winds are very obvious in the form of the shola trees and the appearance of the windward edges of the sholas.

52. *Floristics of the Sholas and Grasslands.*—The species composing the sholas are all evergreen. The flora is a varied one including elements of both tropical and temperate origin. The natural orders most commonly represented by tree species are Myrtaceæ, Stryaceæ and Lauraceæ. Ternstrœmiaceæ and Ericaceæ, are also well represented. *Rhododendron arboreum* (Var. *Nilagiricum*) is conspicuous in the downs. The undergrowth consist largely of Rudiaceous plants and Strobilanthes (Acanthaceæ). Fyson distinguishes nineteen species of Strobilanthes in the Nilgiris. The ground flora consists of a great wealth of ferns and mosses, which are also found on the stems of the shola trees. The species in the sholas are numerous and the following list gives some of the common species found in the sholas and adjoining grasslands :—

I. *Ternstrœmia japonica, Eugenia calophyllifolia, Eugenia arnottiana, Eugenia montana, Michelia nilagirica, Gordonia obtusa, Sideroxylon tomentosum, Meliosma wightii, Elaeocarpus munrii, Elaeocarpus oblongus, Photinia notoniana, Photinialindleyana, Cinnonum wightii, litsaea wightiana, Eurya japonica, Rhododendron arboreum, Euonymus crenulatus, Mcea indica, Hydnocarpus alpina, Pittospermum nilghirense, Evodia roxburghiana, Mappia tomentosa, Llex wightianna, Simplocas spicata, Symplocos foliosa, Neolitsaea zeylanica, Glochidon nilgherrense, Daphniphyllum glacescens and Macaranga indica.*

II. *Turpinia nepalensis, Rhamnus wightii, Vibernum erubescens, Vibernum venulosus, Vaccinium nigheerrense, Vaccinium leschenaultii, Ligustrum roxbughii, Phychotria congesta, Lasiosiphon enocephalus and Mahonia leschenaultii.*

III. *Gaultheria fragrantissima, Berberis tinctoria, Hypericum mysorense, Dodonea viscosa, Rhodomyrtus tomentosus, Osbeckia wightianna, Wenlandia notoniana, Hedyotis stylosa, Ixora notoniana, Pavetta orevifolia, Strobilanthes spp., Eupatorium glandulosum (invasive exotic), Pogostemmon rotundatus, Fragaria nilgherrecis, Sonerila speciosa, Impatiens spp., Ranunculus spp., Desmodium scalpe, Crotalaria barbata, Hydrocotyle javanica, Senicio corymbosis, Anemone rivularis, Viola serpens and Lilium nigherrense.*

IV. *Rosa leschenaultianna, Clematis wightianna, Rubus spp., Schefflera spp., Elaeagnus kologa, Elaeagnus latifolia, Toddalia asiatica, Arundinaria wightianna* (reed bamboo), ferns and mosses (among the ferns the tree fern Alsophila latebrosa is noteworthy.

V. *Mainly in the Downs.*—A complex of grasses, the more common being *Andropogon pertusus, Ischaemum pilosum, Themeda imberbis, Cymbopogon Polyneuros, Eragrostis nigrum, Andropogon falcaces, Chrysopogon wightianus* and *Tripogon bromoides.* In swampy ground the composition of the vegetation is different. Often sedges are found. Near Bison Swamp and in the vallys of Billathadalla and Muku salamisri (Orchis mascula) occurs.

53. Though it is convenient to speak of the sholas as an ecological unit, their composition, size and height growth vary according to altitude, aspect and their situation in the eastern or the western half of the plateau. *Hydnocarpus alpina* is found gregariously mostly in the eastern half of the plateau; a notable example of the type of forest containing this species is found on the slopes of Hulikal Durg. *Eurya* and *Vaccinium* are more common in the western part of the plateau. Similarly the underwood species Mahonia is practically confined to the western plateau. Certain species such as, *Turpinia, Symplocos, Eugenia* and *Rhododendron* are universally found in all sholas. The stunt growth of the trees which is a characteristic of the high elevation sholas changes with decreasing altitude and the height growth gradually increases till in the outer slopes of Coonoor and in the western slopes near Naduvattam in the region of about 5,000 feet sea level, the shola is definitely of the high forest type and merges insensibly into the sub-tropical evergreen forest which is found below.

54. The sholas are distributed all over the rolling downs occupying mostly the sheltered folds in the hills either at the heads of the streams on the converging slopes or in wrinkles, hollows, concave declivities and depressions caused by landslips on the slopes of the hills. They are usually confined to sites where there is good drainage and sufficient moisture. The presence of an adequate amount of soil moisture appears to be an essential condition for the growth of the shola, especially in the regions were ground frosts are common. Where frosts are not common, the shola appears to be less fastidious about soil moisture. Sholas, however, are not found in flat country, where the movement of water is sluggish or in swamps, thereby indicating that they are very sensitive to bad soil aeration though they need a certain amount of moisture. Good drainage is, therefore, as important as sufficiency of moisture in the soil. As regards the soil requirements, the sholas exhibit a wide tolerance in the nature of soil. The shola trees are generally shallow rooted whatever be the depth of soil and sholas are usually in areas containing shallow soil which overlie bare rock. In spite of the shola trees being shallow rooted, the general morphology of the tree formation and the sheltered nature of their situation help them against the violence of the monsoon gales and hence windfalls in sholas are few.

55. *Evergreen Subseres on Cleared Shola sites.*—Over the whole of Coonoor Range and in the neighbourhood of Ootacamund, stretches of country are occupied by a kind of evergreen scrub, an associes of herbaceous, shrubby and arborescent evergreen species. The commonly found species in the type are *Rhodomyrtus tomentosus, Dodonea viscosa, Wendlandia notoniana, Barbaris tinctoria, Hypericum mysorense, Mahonia leschenaultii, Robus spp.*, Strobilanthes spp. and Bracken. Stray specimens of Rhododendron and its regeneration are also found. Evergreen scrub of this kind obviously would be considered as a transitory community, marking a stage in plant succession to shola climax. Various stages of formation from pure Bracken and Hypericum to more mixed formations with small specimens of shola species are found. But most of the scrubs now found in the Nilgiris are not the transitory stages in primary succession towards shola climax but are stages in the secondary serial succession taking place in localities formerly occupied by shola forest. The fact that the evergreen scrubs are common in those parts of the district where Badagas had done shifting cultivation in the past, lands support to this view. It is also found that the secondary succession in a cleared or burnt out shola is often an evergreen scrub and rarely a pure patch of grass.

56. *Grasslands of the Downs.*—All over the Nilgiri plateau in the reserved forests, the land not occupied by sholas or evergreen scrub or artificial plantations is covered by a complex of grasses [vide paragraph 51 (V)]. The dominance of grassland over forest is striking in the Wenlock Downs and in the Kundahs. The vast expense of grassy areas interspersed with small sholas in the Wenlock Downs is the homeland of pastoral race of Todas. The grass in this region is only few inches high due to regular grassing of Toda buffaloes and repeated fires. But in the Kundahs where the grazing is relatively light and the rainfall more heavy the grass is much taller and in places which have escaped the scorching effect of fires for a few years the grass is as much as two feet high. The Kundahs constitute the principal catchment area of the river systems of the Bhavani and the Moyar. Yet in this tract the forest occupies a smaller area when compared with the grassland. The absence of fringing forests along perennial watercourses and rivers on the western plateau is a remarkable feature of the Nilgiris vegetation.

57. In the dry season in February-March the grasslands get very dry and inflammable and the greater part of them are burnt annually for the sake of tender grass. Repeated burning of these grassy areas appear to have been taking place from time immemorial and it has unquestionably exerted very great influence on the present distribution of the very fire-tender montane evergreen forests. Burning appears to completely prevent regeneration of any shola tree species except Rhododendrons. Every fire scorches the periphery of the scattered sholas and prevent it from being an invasive type of vegetation along its borders. The grassy areas in the Downs are prone to suffer from frost and any

possibility of primary succession to commence under the shelter of Bracken or Hypericum, or for any of the secondary stages of the evergreen scrub to proceed on its onward march to shola climax is set at naught by the repeated fires, grazing, the nature of the soil in the Downs and by frost. Nomadic graziers have occupied the Downs for a long time and have burnt the grass for the sake of the early flush of new growth that follows a fire, and it is definite that the shola forest occupies a far smaller proportion of the area than it did in the past. But the fact that at least a considerable extent of grasslands had remained stable as grassy patches for a long time in the exposed slopes where frosts are common cannot be disputed in view of the earliest descriptions of the locality and the ecological factors that had their play in the locality under consideration.

58. *Invasive plants on grasslands.*—Three exotics, namely, *Eupatorium glandulosum* (E. riparium), *Ulex europeus* (gorse) and *Cytisus scoparius* (yellow broom) are making considerable in roads into grasslands. Eupatorum is the most aggressive of the invaders and wherever the soil had been disturbed (either by the hooves of the Toda buffaloes in the Downs or by temporary cultivation elsewhere or in the bluegum plantations, it readily takes possession of the area. In certain places it had occupied the areas gregariously forming unsightly colonies when contrasted with the greer glory of the rolling grasslands. Eupatorium is a Mexican species and is an escape from the gardens where it was introduced early in this century. It is not easy to eradicate it in the areas where it had colonized. However, this Nilgiri weed appears to be checking the spread of fires into sholas by colonizing the burnt edge of sholas in the form of a dense green belt round their periphery.

59. Gorse was introduced on the plateau as an ornamental plant. It has since spread over considerable areas, especially on the slopes falling to Parson's Valley and in the neighbourhood of Nanjanad. Except for its yellow flowers which show all round the year, the plant in itself is not graceful to look at, for it is a spiny shrub with its main branches thickly set with short branches ending in thorns and bearing spinelike leaves. It has nothing to recommend except for its yellow flowers *en masse*. Possibly out of sentimental liking, the British had introduced it in the Downs, as it is one of the species which had spread all over Western Europe on dry gravelly ground.

60. Broom is a native of Western Europe and is commonly found in England and Scotland on dry hilly wastes. It had been introduced on the Nilgiri plateau during the early days of the British occupation and is well established around Ootacamund and in the cultivated valleys to the south of it. It is commonly found on the slopes near Nanjanad along the road to Avalanche and in small areas at the head of the bridal-path to Bangi Tappal. It is much less invasive than Eupatorium or gorse. It has dark green foliage with upper leaves often reduced to single leaflets. It bears yellow flowers. The flowers have an interesting mechanism for cross-pollination (vide Fyson's Flora of the South Indian Hill Station, Volume 1, page 138).

61. Apart from the exotics, species like *Hypericum mysorense*, Bracken, *Gaultheria fragrantissima, Berbaris tinctoria* occur commonly in the neighbourhood of sholas. Even on grassy slopes, shrubby patches are found in areas where the soil conditions are a little better and the rainfall heavier. In more favourable situations as in the eastern part of the plateau, where the incidence of frost, fire and grazing is very much less, shrub associations with *Rhodomyrtus tomentosa, Hypericum mysorense, Dodonea visoosa*, Rubus spp., *Osbeckia wightianna*, and Strobilanthes are common. Rhododendrons appear to be the only tree species that can persist in the repeatedly burnt grasslands as they are often seen either isolated or in clumps on grassy slopes. Pure patches of Gaultheria are also characteristic in this respect. Possibly they withstand frost better. There is a school of thought that the scattered Rhododendrons are the vestiges of destroyed sholas but the fact that they are strong light demanders and do not regenerate freely in the sholas but do so in the open in spite of adverse conditions would appear to indicate that they are one of the pioneer tree species in the progression towards shola formation and tending to disappear with the mature development of sholas. The scattered trees now found may be regarded as one of the primary stage arrested from further progression by factors inimical to shola formation.

62. The ecological status of the shola-grassland formation is a subject of great interest. That the shola is the climatic climax is evident by the study of the altitudinal zonation of the forests on the outer slopes, which shows that with increasing altitude the progression is towards an evergreen climax. The shola forests are found to be a stable plant community in equilibrium with the climatic and edaphic factors of the folds in the plateau. As regards the fact that the shola is the forest climax on the plateau there is no difference of opinion. But differing opinions had been held as regards the status of grassland surrounding the sholas. In Ranganathan's Working Plan for the Nilgiris Division (1938–1948) the author of the plan was of the opinion that the grassland is also the climatic climax over at least the greater part of the territory which it occupies at present. The reasons given for arriving at that conclusion were : (i) the earliest pictures that are available of the surroundings of the Nilgiris depict treeless hillsides and small woods confined to the folds of the hills, (ii) the grasslands should have existed as such, for a long time, at least from the early ages

when the Todas began using the pastures for their cattle, (iii) a plant community which had been in possession of the territory for centuries is entitled to be called a stable association, (iv) the Todas are not axemen and do not practice agriculture and do not clear forests, (v) over most of the tracts of the grasslands the rainfall is such as is commonly associated with a forest climate and yet the grass had been at home in this habitat for a very long time, and (vi) more grazing and annual burning of Todas could not have converted a forest vegetation into an open treeless grassland under the conditions existing in the locality. Evidence elsewhere shows that such biotic factors degrade the forest climax into poor scrub, but the forest itself shows no signs of complete disappearance leaving pure grassy stretches, unless some other natural factor is operating. In fact, even in the Nilgiris, the abandoned clearings of the Badaga country, where sholas had been destroyed and burnt in the past, in the interests of agriculture and pasture, a degraded evergreen scrub had been left behind. For the reasons given above, it was concluded that at least a considerable area of the grasslands must be regarded as a climatic climax of the plateau, because on the above considerations it became overwhelmingly probable that the grasslands are not secondary to a previously existing climax. This conclusion led to the recognition of two fundamentally different climatic climaxes within the same climatic region. It was also stated that the topographical distribution of the sholas and the grasslands on the plateau was primarily determined by a natural factor-frost than by the biotic factors of grazing and burning. The fact that sholas occupy the sheltered folds of the hills and thrive better in areas protected from the thawing effects of the morning sun (western and northern slopes) and in the more moist regions of the generally frost affected western plateau so that the danger of wilting due to the freezing of the upper soil moisture as a result of frost is neutralized by the abundence of moving soil moisture in the deeper layers of the soil, indicate the effective part which frost plays in the locality. But the presence of a dual climax is not one of the recognized phenomenon in the usually accepted systems of ecology.

63. Champion, however, in his Preliminary Survey of Forest Types of India and Burma, writes that he is inclined to think that the grasslands are nowhere the climatic climax formation in the Nilgiris, though the wet hollows being probably too wet for tree growth would carry a peat forming sedge vegetation and the shallow areas would carry only scrub associations. Exposure to wind exerts an influential check on forest growth and renders all clearings slow to recover. Grasses accordingly occupy all clearings, and periodic fires extend every grassy patch eating away the forest till it is restricted to damper sites. Champion, it would appear, is definitely of the opinion that it is the periodic firing of grasslands by the graziers had caused the present distribution of grassland and sholas, and that in the past clearings have been made. His theory does not fully explain why a more or less stable formation of grassland should be established in an area with good rainfall, by the periodic firing alone when such treatment of old clearings has not led to such extensive grassy stretches elsewhere but is always associated with a degraded secondary scrub.

64. While Champion's opinion regarding the status of grassland in Todanad is acceptable in so far as that it is not a climatic climax of the locality, his belief they are secondary to a previously existing forest climax and that grass had occupied all clearings had not been borne out by the actual conditions that prevailed and are prevailing in the habitat. The Todas are not axemen and do not normally practice agriculture by clearing forests. It is likely that their pastoral mode of life was evolved by the environment in which they found themselves. Further, in places where clearings of shola had been known to have taken place as in the Badaga country in the east and south of the Nilgiris, a mixture of grass and an evergreen scrub is found in spite of the fact grazing and fires are prevalent. At the same time, because some of the factors of the locality suggest that it is overwhelmingly improbable that a considerable area of the grassland is secondary to a previously existing forest climax, and because the grassy stretches have been at home in this habitat as a stable community for centuries, the grasslands cannot be the climatic climax of the Nilgiri plateau over a large part of the area as stated in Ranganathan's plan,because the acceptance of a dual climatic climax within the same climatic region is not possible. It has been accepted without any reservation by all, including Ranganathan, that the shola is the climatic climax of the locality. And, since there cannot be two climaxes within the same climate, the status of the grassland in the plateau will have to be considered as a pre-climax, because Ranganathan's searching study of the ecology of the locality had clearly revealed that the grassland cannot be secondary to a previously present forest climax, and because factors like grazing and burning can only degrade the forest climax at most to a miserable scrub in view of the rainfall of the locality and not permanently stabilize such a formation of grassland over extensive areas. Most of the grassy areas cannot also be considered as a sub-climax, which is prevented from progressing to the climatic climax only by the biotic factors like grazing and burning. In a sub-climax once the retarding forces are checked there is a tendency to progress towards the general climax. But in the Nilgiris even in areas where the burning and grazing are less prevalent, grassy patches have held their own for a long time. It is also found that in this region there are a certain set of natural factor

at play (such as frost, lack of sufficient soil moisture and its drainage except in the folds of the hills nature of topography) which prevent the formation of the sholas over the entire stretch of the country and stabilize the grassland stage of succession. Since the grassland formation is conditioned by a greater stability than an ordinary sub-climax, it is evident that at least a considerable area of the grassland in the plateau is a pre-climax and is governed by a set of natural factors which do not admit the easy passage towards the final climax. Only in places where the grassland is to a great degree associated with other species (as in the borders of sholas and in the lower altitudes of the plateau) can it be considered as a sub-climax prevented from reaching the climax by the inhibitory factors like grazing and repeated burning. It would appear that in the gradual development of vegetation in the plateau, where conditions were favourable in the sheltered folds of the hills (i.e., where there was protection from exposure of winds, sufficient soil moisture and good drainage) the grass was succeeded by herbaceous and shrubby species like Bracken, Hypericum, Dodonea, etc., in the initial stages, and followed by bigger shrubs like Rhodomyrtus, Berberis, Mahonia, etc., and in the shelter of these, the evergreen shola species gradually creeped in and slowly developed into mature sholas. Therefore, while it may be admitted that sholas were prevented from being an invasive type of vegetation along their periphery, or were eaten away gradually round their edges by repeated firing leaving different grades of secondary type of vegetation as a sub-climax in the vicinity of sholas where conditions for the development of sholas may exist, it is clear that over considerable areas where stretches of grassland had reigned supreme for centuries, the ecological status of such grassy patches is that of pre-climax mainly conditioned by the extent of soil moisture, exposure and frost. The final stage completing the plant succession under the more favourable conditions prevailing in the plateau had been reached in the formation of sholas in the sheltered, cooler and moisture sites in the folds of the rolling hills.

65. *Plantations of exotics on the plateau.*—The Nilgiri plateau had been the scene of numerous experiments to naturalize exotic species. The attempts to introduce the species of the temperate regions of India and Europe have generally not been successful. Australian species have done very well especially the wattles and *Eucalyptus globulus*.

66. The Australian Acacias (*wattles*) were introduced in the Nilgiris as early as 1840. Among the Acacias, *Acacia dealbata* (silver wattle) had naturalized itself and run over extensive areas but unfortunately it is not the most valued of the wattles commercially. However it is useful for covering waste lands and would probably make successful village forests. Attempts have been made to grow on a large scale *Acacia decurrens* (green wattle) and *Acacia mollissima* (black wattle) and they have done well. Black wattle is the most favoured of the tannin producers and hence the cultivation of wattle is now confined mainly to this species.

67. Acacia melonoxylon (*blackwood*).—Another species of Australian Acacia which had long been acclimatized in the Nilgiris is *Acacia melonoxylon*. In view of its low coppicing power and liability for attack by Loranthus, the proportion of the species in the old plantation sites is very low and in some cases had almost disappeared. However some of the good specimens found on the edges of the roads or plantations have grown to a height of over 100 feet, though seldom exceeding six feet in girth. It is a very symmetrical and handsome tree with a towering crown reaching to about 10 to 15 feet from the ground. It has a dense olive green foliage, which consists of phyllodes, the leaves being found only in the juvenile stage. It can be propagated artificially by seed but reproduction by root-suckers is common in nature. The timber is dark brown in colour, weighs 36 pounds to a cubic foot, but is not valued locally though in its home in Australia, where it grows only to a lesser height, it produces good timber known as blackwood.

68. Acacia dealbata (*silver wattle*).—On the Nilgiris the chief characteristic of the silver wattle is its habit of spreading vigorously by root-suckers, which it throws up with extraordinary profusion at considerable and ever increasing distances from the parent tree. Once established it is difficult to eradicate. The result of the sucker production is a dense thicket of whiplike stems of small diameter. In the Nilgiris the species has a straggling horizontal habit of growth and a straight grown silver wattle is a rare specimen of the exotic. Whereas in its home in Tasmania the trees grown to immense sizes (over 100 feet in height and 10 feet in girth) and is not known to have a straggling habit, in the Nilgiris silver wattle trees over 40 feet in height and 4 feet in girth are rare. Its timber is not favoured locally, but is used as firewood mainly by poor classes of the community. Its main interest lies (i) in its power to occupy wastes and inferior soil, (ii) its ability to withstand much ill-treatment and (iii) its annual blaze of yellow flowers, which are fragrant and beautiful.

69. Acacia decurrens (*green wattle*).—Though said to be introduced as early as 1840 and cultivated in tea estates and cinchona plantations as a nurse crop and as wind-belts for a fairly long time its cultivation on an extensive scale by the Forest department had been mainly during the World War II, because in the earlier years the wattle bark produced

here fetched a low price due to intense competition from South Africa. It grows to a medium sized tree reaching to a height of about 90 feet and 15 inches in diameter, but is shallow rooted. Its coppicing power is low. It has a greenish bark with dark decurrent streaks noticeable on the stems. It has a glabrous foliage with decurrent leaf bases as charactaceous wings arising from the stems. The pinules of the leaves are more spaced apart on the rachis when compared with the black wattle, which has a more closely-set pinules and tomentose while young. Acacia decurrens produces a mass of bright yellow flowers mainly in October-November and April-May, when compared with the light lemon yellow colour of the black wattle flowers which are found mainly in January-February, though sporadically all round the year. The green wattle grows comparatively faster than the black wattle in the early stages, and produces fairly straight clean, knot-free timber. It is more resistent to frost and insect enemies. It is a more graceful tree to look at than the black wattle. Its bark has 35 to 40 per cent tannin content. Though its tannin content is very slightly higher than that of the black wattle, it contains a significant percentage of undesirable red and yellow colouring matter, resulting in a leather of poor colour and hence of a reduced value in trade.

70. Acacia mollissima (*black wattle*).—Most of the green wattle areas have already been converted into black wattle for the reason that it gives the maximum of the most desired tannin extract from its bark (about 35 per cent). New areas are now planted only with the mossed seedlings of the black wattle. Acacia mollissima grows to good sizes but its coppicing power is low. It attains about 90 feet height and 18 inches diameter, but is shallow rooted and liable to be blown over during heavy monsoon gales. Its bark is smooth and dark brown in colour. It regenerates itself naturally from seeds in cleared wattle plantation areas and it is observed that a light fire running over the cleared plantation site produces more abundant regeneration. The natural regeneration of the green wattle is able to establish itself comparatively more easily and vigorously than the black wattle. The black wattle seedlings are frost tender. Though in Natal (South Africa: Latitude 26°—32° S) wattle grows best from 1,000 to 3,000 feet altitude, in India which is near the equator the best growth has been found to occur at elevations between 5,500 feet and 7,500 feet. At elevations where the incidence of frost is heavy and the exposure to winds great, as the initial growth is slow. Black wattle apart from being useful as a tannin producer gives satisfactory firewood; the spent wattle bark, after the extraction of tannin, can be used for the manufacture of coarse grades of paper and strawboards. Wattlewood holds promise of being used as pulp with other long fibred pulps. The growth of the species in worked soils, for example in potato grown tuckles, is rapid and is due to both better soil aeration and the residual manure left after the potato crop.

71. Eucalyptus globulus (*bluegum*).—Among the Eucalyptus species introduced in the Nilgiris, the pride of place for naturalization goes to the Australian species, *Eucalyptus globulus*. It grows magnificently on the Nilgiris. In its height growth, the rate of girth increment and coppicing power it has few rivals. Some specimens in the Nilgiris are over 200 feet in height for an age of about 60 years. Since its wood had been chiefly of value as firewood, older specimens are getting fewer and only young coppice regrowth not more than 20 years of age is frequently met with in the plateau. Bluegum, as it is commonly called, is a favourite firewood of these hills. The species coppices easily sending numerous shoots both from the exposed cambium and the periphery of the stool, but chiefly from the latter. Hence a careful trimming of the stool while coppicing or cutting them very low to the ground are not absolutely essential. The young coppice springs up directly after felling and reaches a height of over 10 feet within six months. The number of shoots to a stool is several in early years but in the fifth year the average is seldom more than four and in 15 years is seldom more than three. The growth of the species whether from seed or coppice is extraordinarily rapid. It is the wide and easy cultivation of the bluegum and its enormous coppicing power that had saved the destruction of sholas for the sake of firewood.

72. Bluegum plantations had been raised mostly as a pure crop but cases of mixture of blucgum with wattles are also of common occurrence in the past. As it was found that the admixture of either the introduced wattle or the natural evergreen species springing up in the area tend to retard the satisfactory development of bluegum, mixed plantations are not raised at present. However, even in pure bluegum plantations, rank undergrowth of brambles, bracken, Strobilanthes, Adenostemma, Plectranthes and Eupatorium mixed with some shola species are common in plantations raised in old shola sites. In areas where bluegum had been raised in grass land very little undergrowth is the rule though Eupatorium may form dense thickets in the openings.

73. *Hardwood Eucalyptus plantations.*—Different species of Eucalyptus which in Australia yield good timber for sleepers and constructional purposes have been raised in the Nilgiris but they have not been found to show satisfactory development in growth or to yield good timber. The oldest of the plantations were raised from 1910 to 1912 in small patches. Planting was revived in the year 1922 and continued till 1936. Since they were found not

to yield satisfactory timber, some of them have since been converted into bluegum plantations after the standing growth had been disposed of as firewood. The hardwood Eucalyptus species tried as small plantation in the Nilgiris were *Eucalyptus eugenioides* (white stringy bark), *Epilularis* (black butt), *E. hemipheie* (grey box), *E. propinqua*, *E. Acmenoides* (white mahogany), *E. Paniculata* (grey iron bark), *E. punctata* (grey gum) and *E. crebra* (narrow leaf iron bark), other species experimented with *E. gigantes*, *E. regans* (white montainash or Australian Oak), *E. marginata* (Jarrah) and *E. hiversicalour* (Karrie). The hardwood Eucalyptus plantations at present serve no utility as timber producing stands and such of the small areas that are to be retained will be only for historical and arboretal interest. Of the species tried as plantations *E. hemiphloia* and *E. crebra* have uniformly fared badly. *E. punctata*, *E. pilularaia*, *E. propinqua* and *E. eugenioides*, though have managed to grow to moderate sizes, their rate of growth had been poor when compared with the growth in Australia. *E. punctata* does not grow straight or attain proper form and the trees are not wind-firm. Of all species raised as plantations *E. eugenioides* and *E. pilularis* have shown comparatively satisfactory development, though none of the hardwood Eucalyptus species tried locally had produced any good timber.

74. *Conifer plantations.*—These have resulted from Gamble's enterprising experiments between the years 1886 and 1891. *Calitris rhomboidea* of Australia is the only species that is fairly well established. Occasional specimens of *Pinus longifolia* very rarely in good form, and Cryptomeria japonica are also found at present. Small plantations of *Cupressus microcarpa*, *C. torulosa* and *C. lawsoniana* also exist. The climate of the Nilgiri plateau appears to be unsuitable for the free growth of the conifers.

75. *Miscellaneous Exotics.*—Some of the other exotics that deserve mention are *Casuarina quadruvalvis* tried in Cairn hill and *Casuarina suberosa* tried in Teneriffe and Tent Hills. *Grevellia robusta* had also been tried. The casuarinas are a failure. *Grevellia robusta*, though has no claim here as a timber tree, had established itself well and is found commonly as a shade tree in tea estates. *Pyrethrum cinererari folium* was cultivated for its flowers which were demanded in great quantities during World War II. The pyrethrum flowers are valued for their insecticidal value and they grow fairly well in the plateau on different types of soils. But attempts to grow them in areas where potato had been grown with manure had not been successful.

76. *The moist deciduous and dry teak forests of Mudumalai Range.*—In the north-western corner of Sigur Range and the whole of the Mudumalai Range which receive rainfall mainly from the south-west monsoon, the type of forest commonly encountered is a fairly high forest with broad leaved species, most of which being deciduous. Locally they are known as monsoon forests, and is composed largely of the common timber species of South India. The height growth of the trees vary from 100 feet to 40 feet and the girth is such as to yield merchantable timber. The chief feature of the monsoon forests is a leafless period in the dry season (March to May) which may or may not begin even in the cold weather according to the relative moisture conditions of the locality. During the leafless period the upper canopy is almost entirely leafless though often there is a good sprinkling of evergreens in the underwood and shrub cover in the moister situations.

77. In Mudumalai Range which lies in the Nilgiri-Wynaad, the average elevation is about 5,000 feet and the annual rainfall varies from 45 to 75 inches. The general type of forest may be defined as 'Southern Tropical Moist Deciduous Forests' (Champion's Type 3 A-C 1) in the moister regions and the 'Dry Teak Forests' (Champion's Type 4 A-C 1) in the areas with lesser rainfall. Variations in type and quality are caused not only along the gradient in the rainfall from the south-west to north-east, but also due to sudden variations due to frequent changes in the nature of the soil and its drainage and water content in the different parts of the undulating country. At the higher limit of the rainfall evergreen tree species begin to intrude as in the case of Gadsbrook reserve and parts of Benne reserve, while at the lower limit the forest degenerates into open stunted deciduous type of which *Anogeissus latifolia* is the type species. Further, along the gradient of rainfall though the height growth and general luxuriance progressively diminish towards the north-east direction, the proportion of teak in the mixed deciduous forest increases in quantity though their quality diminishes. In fact along the southern boundary of Mudumalai Range (south-west portions of Mudumalai and Teppakadu blocks) and over a considerable area of the forest in the south-western part of Benne block which receive comparatively greater amount of rainfall in the range, teak is not commonly found. In the northern and north-eastern part of the range where the rainfall is appreciably less teak is almost universally present.

78. Several small patches of tropical evergreen forest occur in the vicinity of Benne. The largest of these is about 25 acres in compartment 31. The type may be fitted into 'Southern Tropical Evergreen Forest' (Champion's Type 1 A-C 3) and some of the species met with are *Palaquium ellipticum*, *Artocarpus hirsuta*, *Michdia champaca*, *Hydnocarpus wightiana*, *Schleichera trijuga*, *Calophyllum tomentosum*, *Evodia roxburghiana*, *Cullenia excelsa* and *Acrocarpus fraxinifolius*.

79. The general type of the forests that occur in Benne block and south-western part of Mudumalai and Teppakadu blocks is the 'Southern Tropical Moist Deciduous Forest' (Champion's Type 4 A-C 1) and the rainfall varies from 60 to 80 inches. It is a closed high forest, the trees approximating to 100 feet in height. The dominant species are mostly deciduous. Although the intimate mixture of the species is the rule, a relatively smaller number of the species together form a greater part of the canopy and relatively pure associations are met with, for example *Terminalia tomentosa* with bamboo in the moist situations. Some evergreen dominants are also found but they are few and the evergreen habit is common only in the lower storey thus giving it a relatively evergreen appearance when compared with the more open forests of the northern and eastern parts of Mudumalai and Teppakadu blocks. The greater parts of the forests are on the hilly ground. The most characteristic species is *Tectona grandis* which is of excellent development wherever the soil permits. In the top canopy it is associated with *Terminalia tomentosa*, *Pterocarpus marsupium* and *Lagerstroemia lanceolata*. *Adina cardifolia* appears in the relatively dry areas. *Bambusa arundinacia* is common in fringes along the margins of water-courses and on moist soils. Other species commonly met with are *Dalbergia latifolia*, *Ougenia dalberioides*, *Stereospermum chelnoides*, *S. xylocarpum*, *Kydia calcycina*, *Bombax malabaricum*, *Albizzia odoratissima*, *Anogeissus latifolia*, *Terminalia belerica*, *T. chebula*, *Lannea grandis*, *Phyllanthus emblica*, *Shorea talura*, *Schelichera trijuga* and *Buchanania latifolia*. There are regions over which *Terminalia tomentosa* has a marked predominance. The ground vegetation in this moist tropical deciduous forest is typically herbaceous and consists largely of wild arrowroot with occasional shrubs of Helictres, Solanum, Eupatorium and Lantana. In the dry season the wild arrowroot dies down and the forest floor appears relatively bare. Grass is not present in large amount except where the canopy is open. Natural regeneration of tree species is deficient due to dense overhead cover and the presence of humus in the soil.

80. Locally throughout the moist deciduous type of forest bamboo brakes occur along the stream sides and shady slopes. It forms more or less continuous forest of tall clumps of *Bambusa arundinacea* with occasional standards of Terminalias and other trees. *Bambusa arundinacea* occurs in profusion in the moist climate of Benne block and along the Moyar in Teppakadu block. The bamboo brakes occurring in this region of the Southern Tropical Moist Deciduous Forests described above forms a subsidiary type and correspond to the edaphic type 'Southern Moist Bamboo Brakes' (Champion's Type M. Tr./E. 9).

81. A relatively dry deciduous type of forest is found in parts of Doddakatti, Mudumalai and Teppakadu blocks in the areas with comparatively less rainfall. The upper canopy is uneven and not very dense. It is formed by a mixture of species practically most of which are deciduous during the dry season, usually for several months. During the leafless period the tract offers a very forlorn appearance and in the hot weather fires sweep through them. The general height growth of this type is below 60 feet and the number of species encountered is much less than in the tropical moist deciduous type described in paragraph 79. More or less pure associations are usually traced either due to soil peculiarities or fires. Gregarious patches of *Shorea talura* occur in Doddakatti and northern parts of Teppakadu block, the regeneration of the species being favoured by the prevalence of fires. The proportion of teak is also great in areas frequently swept over by fires. In drier patches sporadic clumps of stunted *Dendrocalamus strictus* are found, *Bambusa arundinacia* being confined to moist situations as the river beds. *Terminalia chebula* is practically confined to Doddakatti block. *Cassia fistula* occurs in the vicinity of Kargudi in good quantities. Epiphytes and ferns are not conspicuous in this type of forest. Grass is found amidst shrubs but wherever the canopy is very open it is found in abundance. With repeated fires the grass gets strongly established resulting in Savannah forms. The most characteristic tree species in this type of forest are *Tectona grandis*, *Anogeisus latifolia* and *Terminalia tomentosa*. Teak of all-India Quality IV to IV/V occur in this type of forest, the north-eastern part of Mudumalai block, Doddakatti block and the south-western part of Sigur Range containing the more stunted forms. This type of dry deciduous Forest where teak is predominant is called the 'Dry Teak Forest' (Champion's Type 4 A-C 1). It is one of the sub-types of the general type 'Southern Tropical Dry Deciduous forest and differs from the sub-type 'South Indian Mixed Deciduous Forest' described below in paragraph 82 in that the dry teak type occupies the physiologically moister soils in the dry regions and in the borders of the moist deciduous forests in the region of a rainfall of about 50 to 60 inches and merge gradually with the dry miscellaneous type at the drier end. The general floristics of this type include *Tectona grandis*, *Terminalia tomentosa*, *T. belerica*, *T. chebula*, *Anogeissus latifolia*, *Ougenia dalbergioides*, *Cassia fistula*, *Butea frondosa*, *Ptreocarpus marsumpium* among the tree species. Grass is usually heavy and include *Cymbopogon citratus*, *Andropogon controtas*, *Themeda cymbaria*, *Cymbopogon flexuosus* (very common), *Themeda imberbis* (confined to dry localities) and *Imperate arundinacea* (in moist locations). Where the canopy tends to close up, the grass gives place to *Spatholobus roxburghii*. Lantana and Eupatorium are found scattered, though prior to 1924 Eupatorium is said to have been practically absent. The typical under growth in these forest is however

the assemblage of grasses. The presence of dry grass in readily inflammable bunches predisposes the forest to fire which occurs every hot weather and is always a menace. The occurrence of fire cleans up the forest floor inducing the regeneration of species like teak and shorea but with the onset of monsoon the grass comes up again more deeply entrenched than before.

82. In areas where the annual rainfall is less than 40 inches as in parts of Doddakatti block, in the north-eastern part of Mudumalai and Teppakadu blocks and in the western part of Sigur Range, as well as amidst the dry teak forest where the soil conditions are unsuitable for the growth of teak, a dry type of deciduous forests wherein the most characteristic species is *Anogeissus latifolia* occurs. This type corresponds to the ' South Indian Dry Mixed Deciduous Forest ' (Champion's Type 4 A-C 2). Thorny plants tend to increase in the lower storey and grass is conspicuous on the forest floor. The trees are about 45 feet in height and the stems are often found to lack in a straight habit. *Anogeissus latifolia, Terminalia tomentosa, Chloroxylon swietinia, Albizzia amara, Butea frondosa, Boswellia serrata, Shorea talura* and *Kydia calycina* are some of the species met with in this type. The extent of teak is low when compared with the dry teak type and the presence of *Anogeissus latifolia* is striking. The occurrence of *Acacia sundra* towards the eastern limits of this type indicates the gradual transition to the thorn forests common in the Sigur Range.

83. The different types of forests found in the Nilgiri-Wynaad has been classified in the foregoing paragraphs in accordance with Champion's All-India Classification. However for the purpose of delineating on the stock maps accompanying this working plan, the local variations and subtypes especially with reference to the abundance of teak and the variations in the height growth of the forest, the monsoon forests of the Nilgiri-Wynaad may be conveniently classified broadly under two types, namely, (i) the teak type and (ii) the mixed type. The teak type is one where 50 per cent or more of the timber crop is usually teak. The mixed type is characterized by the notable absence or poor representation of teak. In order to note on the stock maps the variations in height growth within the region, three sub-types have been adopted, namely ' A sub-type ' where the average height of the forest is above 60 feet, ' B sub-type ' where the average height of the forest is between 45 and 60 feet and ' C sub-type ' where the average height is below 45 feet. These subtypes have no reference to any recognized standards of quality or specifications or classification adopted elsewhere, but is mainly devised to represent the local variations in composition and growth in the stock maps accompanying the working plan.

84. *Teak plantations of Mudumalai Range.*—The earliest teak plantations in Mudumalai Range were formed between 1863 and 1875 over an area of 43 acres in compartments 29 and 30 of Benne block and between 1869 and 1875 over an area of 22 acres in compartment 26 of Mudumalai block. They had not received proper thinnings and even now carry an excessive number of stems per acre for their age, with the result there had been no satisfactory development of the stems. Small plantations were raised in 1907–08 in Benne compartments 32 and 33 though they were not successful. Several small experimental plantations were made on carefully selected sites along roadsides in Mudumalai and Teppakadu blocks between 1918 and 1922 and some of them are successful and with proper cultural operations are likely to yield good timber.

85. From the year 1924 annual planting over small areas had been carried out continuously excepting for the short break from 1945 to 1947 during the war years. A regular age gradation is therefore available from 1924 to 1944. The growth in the teak plantations of Mudumalai Range being not rapid as in the moister regions where teak is grown commonly, the plantations remain open. In the early years with a result they are overrun with noxious weed growth chiefly of tall grass and Lantana. The trees are also infested with climbers of Spatholobus. The general height growth of the plantations is poor, though satisfactory girth is noticed. The average plantations of the locality would correspond to the all-India Teak Quality IV to IV/V.

86. *The deciduous scrub of the Masinagudi-Anaikatti plateau.*—Except for the north-western part of Sigur Range which carries a dry mixed deciduous forest with teak and *Anogeissus latifolia* as characteristic species, most of the flatter portions of the range which receive about 35 inches of annual rainfall contain an open deciduous scrub, which is the principal home of sandal of this division. The type of forest found in this area would correspond to Champion's Type D. Tr./2 S/1 ' Secondary Dry Deciduous Forests ' under the general head 'Dry Tropical Deciduous Forests'. The presence of sandal is a characteristic feature of this type of forest. The area is subject to heavy grazing and fires. The surface soil is usually hard and impervious due to exposure and trampling by cattle. The tree species composing the scrub are stunted and commercially useless except for the valuable sandal which occurs all over the region in patches. The stocking in this type of forest is irregular. Thorny species ands pecies unpalatable to cattle tend to predominate

until towards the north and the east of the range and the secondary deciduous forests degenerates itself into a thorn forest with scattered bushes in the arid tracts. This type of degenerated forests would correspond to Champion's type 5A–C1 'Southern Cutch Thorn Forest'.

87. In the thorn forest the characteristic species is the thorny *Acacia sundra* associated with other Acacia and allied thorny Mimosae. Zizyphus is common, while the stunted specimens of the trees of the dry deciduous forests occur scattered throughout the area, notably *Anogeissus latifolia*. Gregarious patches of *Hardwickia binata* also occurs, as for instance near the confluence of Kadar Halla and Moyar. The thorn forest is very open and low, the trees being mostly about 20 to 30 feet in height, the majority of which being hardwood thorny species. The grass growth in the area is very thin, and is exposed to frequent fires and heavy grazing. There is an ill-defined lower storey of smaller trees and large shrubs, mostly spiny and often with other xerophytic characters, extending to low shrub growth of similar character. Climbers are few and those present show xerophytic adaptations.

88. The tree species commonly met with in the Masinagudi-Anaikatti plateau are *Anogeissus latifolia, Albizzia amara, Acacia sundra, Acacia forrugenia, Atlantia monophylla Bauhinia racemosa, Bridelia retusa, Canthium didymum, Cassia fistula, Chloroxylon swietenia Cordia myxa, Diospyros montana, Dalbergia paniculata, Erythroxylon menogynam, Elaeodendron glaucum, Ficus spp., Pongamia glabra, Hardwickia binata, Tectona grandis, Zizyphus xylopyrus,* and the most important of all *Santalam album*.

89. The undergrowth in the forests of Masinagudi-Anaikatti plateau consists mainly of short grasses and a lantana. The following species are also common : *Argyreia cuneata, Cipadessa fruiticosa, Clausena wildenovil, Grewia asfatica, Gymnosporia montana, Opuntia dillenii, Scutia indica, Toddalia aculeata, Solanum spp., Webera corymbosa, Wendlandia notoniana, Randia dumatorum, Carissa carandas. Dodonea viscosa, Zizyphus jujuba and Zizyphus oenoplia*.

90. *Sandal in Sigur range.*—Most of the sandal of the division is found in Sigur range. The most important sandal bearing areas of the range are the northern half of the Singara reserve the margins of Avara Halla in the reserve that bears its name, the margins of Sigur Ghat Road within the limits of Sigur and Kalahatti slopes reserves, the margins of the Sigur River, the Kedar Halla, the Basavan Halla the Sirur Halla and the Tatta Halla, the area around Anaikalmarigudi, the Anaikatti settlement and a number of abandoned cattle-pens in Sigur reserve. Sandal is rare in Moyar reserve, the Kalmalai reserve and the Northern Hay reserve. Scattered trees of sandal are however found along the streams in Moyar reserve, amidst lantana patches in Northern Hay reserve towards its eastern and Bokkapuram reserve, Sholur-Bokkapuram bridle path. Spiked trees are scattered all over the range. The unreserves around Masanagudi are dotted with sandal.

91. *Sandal in Coonoor range.*—Between the altitude limits of 1,500 and 3,500 feet along the outer slopes of the Nilgiris lie a deciduous scrub in which sandal is found to an appreciable extent. The localities in which the sandal is found in Coonoor range are Burliyar, Benhope, Lamb's Rock, Hullical, Tattapalem, Konakari slopes, Kolakombai and Melur slopes. Sandal is fairly abundant near Burliyar but spike occurs in the locality. Sandal occurs in profusion in the slopes of Rangaswami Peak up to an altitude of 5,000 feet which is beyond the optimum range for the species.

92. It is noteworthy that all the sandal areas occurring naturally in this division receive their principal rainfall during the north-east monsoon. The spread of sandal to profusions apparently prevented by the endemic nature of spike in these tracts and also due to the frequent fires. In Hiriyeshege reserve on the eastern slopes of Ootacamund South Range a small patch of sandal had been noticed.

93. *Sandal plantations.*—Small experimental sandal plantations had been raised in this division in different localities. In 1872–73 near the Northern Hay Estate below the Pykara falls, a small plantation of 23 acres was raised but was not a success. Evidently the site was unsuitable, the natural vegetation being of the monsoon forest type with a fairly heavy rainfall. In Konakarai slopes reserve small plantations of sandal have been raised with some measure of success in the early stages. During 1920–1925 sandal seeds were dibbled in compartment 1 of Teppakadu block near the rest-house at Kargudi, over an area of 125 acres. The sandal had failed to establish itself. An area of 30 acres near Teppakadu was regenerated with sandal in combination with field crops in a clear felled area and the sandal trees raised by this method are still found to be thriving. But the experimental plantation raised along the plantations road side near Kakkan Halla ended in complete failure. No sandal plantations had been raised during the last decade in view of the past failures and because of the facts spike disease is endemic in this division.

94. *The forests on the outer slopes.*—The outer slopes and especially the eastern slopes show marked altitudinal zonation in the vegetation that clothes the slopes, which fall from nearly 7,000 feet to about 1,000 feet, below 1,500 feet altitude, the forest is of the Southern Tropical Thorn type. Between 1,500 feet and 3,500 feet the forest bears resemblance to the Tropical Secondary Dry Deciduous type wherein sandal and bamboo are commonly found. Thus a tropical type of forest is found right up to 3,500 feet above the sea level, on the Nilgiri slopes. Between 3,500 and 5,500 feet where the mean annual temperature lies between 65 degrees and 75 degrees F. the annual rainfall about 65 to 70 inches and frost is practically absent except for local patches in the upper reaches, a type of forest classified by Champion as the ' Nilgiri Sub-tropical Evergreen Forest ' (Champion's Type 7-A-C. 1) occurs. This is one of the sub-types of the Southern Sub-tropical Wet Hill Forest. The general floristics of this montane sub-tropical forest show a mixture of species ranging from those of the wet tropical evergreen forests to those of the temperate forests found in the plateau, the former element usually predominating thus indicating that it is a transitional. type of forest. Eugenia is a characteristic genus. Members of the families of Lauraceae and Melastomaceae are common. The forest at first sight resembles very much of the tropical rain forest but not so luxuriant the trees being relatively smaller and with less shapely boles. The stems are often festooned with *Herbaceous epiphyte*:. A dense undergrowth of Strobilanthes is frequently present. Much of the area where this type of forest occurs have been cleared in the past for coffee and tea plantations. On the steeper slopes in the altitudinal range of 3,500 to 5,500 feet which are not quite hospitable for vegetation, a poor deciduous forest of the Sevannah type replaces the sub-tropical evergreen type. This type had been described by Champion as the ' Nilgiri Sub-tropical Hill Sevannah Forest' (Champion's Type S.T. /2. S/1). It is a sub-tropical seral sub-type of the general type, ' Sub-tropical Evergreen Forests '. The Nilgiri Sub-tropical Hill Sevannah type of forest on the steep slopes are usually of an open nature with tall grass 6 to 10 feet high and scattered trees (nearly all deciduous) and firehardy shrubs. These areas get burst repeatedly. *Phoenix humilis* is particularly charcrteristic. The other species commonly found are *Dalbergia latifolia, Anogessus latifolia, Phyllanthus emblica, Wenlandia notoniana* and *Oleaudioica*. The Konakarai slopes reserve small patches of gregarious natural teak occurs within the deciduous zone. From 5,000 feet upwards there is a gradual transition from sub-tropical evergreen type till on the plateau the montane wet temperate forests are reached. In the range of 5,000 to 5,500 feet the transitional forest includes some of the characteristic trees of the tropical evergreen forest. *Mesua ferrea*, for example, is found in appreciable quantities in Hullical, Kolakombai, Tudor Shola, Hill Grove, Lamb's Rock and Haduthorai reserves.

95. Though a zonational vegetation is found on the slopes it has to be mentioned that there is no *marked* zonal differentiation of the tropical, sub-tropical and temperate vegetational types. The tropical and temperate types are definite enough but they appear to merge directly into one another without any distinct intermediate zone with characteristics totally differing from both. The reason for the absence of a well defined sub-tropical type of vegetation may be the proximity to the equator or the nature of the topography being such that the transitional stage can at the most occupy only a relatively little space between the tropical and the temperate types in the ascending altitudes. In the Nilgiris the temperate forests often found on the plateau are of a dense low evergreen type and may be considered ecologically as an upward projection by gradual stages of the tropical evergreen forests found in the lower tracts. The tropical wet evergreen from falls off in height and general luxuriance with ascending elevation till in the transitional stage the sub-tropical wet hill forests and the tropical evergreen forests found in the lower tracts look more or less alike.

96. *Bamboo forests on the outer slopes.*—*Bambusa arundinacea* occurs in Coonoor and Mudumalai ranges. In Coonoor range it occupies Kallar and Burliyar reserves though it is also found in patches in moist situations in Vagappanai, Haduthorai and Hullical reserves. The localities where *Bambusa arundinacea* occurs in Mudumalai range had already been referred to in paragraph 80.

97. *Dendrocalamus strictus*, occurs in Coonoor and Sigur ranges. Patches of growth of this species are also found in Doddakkatti block and northern parts of Mudumalai block in Mudumalai range. *Dendrocalamus strictus* is found gregariously in large patches in Vagappanai, Haduthorai and Hullical reserves. In Sigur range it is found in small patches in Kalahatti slopes and Sigur reserves and lies scattered in fringes along streams in other parts of the range. Both the growth and the quantity of bamboos in Sigur range is poor. *Dendrocalamus strictus* flowered in Coonoor Range between 1915 and 1917.

98. *Mahogany plantation on the Eastern Slopes.*—A small plantation of mahogany (*Swietenia macrophylla*) about three acres in extent exists near Burliyar on the bridle-path from Mettupalayam to Coonoor. The mahogany appears to have been planted as an

experiment between 1870 and 1873. The trees have come up satisfactorily and thinnings have been periodically done. The species regenerates itself profusely. It may be mentioned here that about the same time as this plantation was formed some mahogany trees appear to have been planted near the rest-house at Mudumalai. Some tre es are still found and they have reached good size and height for their age. Profuse natural regeneration of mahogany is found in the Burliyar plantation.

Section 2—Injuries to which the crop is liable.

99. *Natural causes.*—Wind and frost are the common natural causes affecting particularly all efforts of artificial regeneration in the Nilgiri plateau, though the young natural vegetation also suffers a good deal by frost.

100. *Wind.*—The monsoon gales during the south-west monsoon do some damage or other to every plantation on the plateau by uprooting some stems in the stand. The wattles being shallow rooted are prone to suffer greater damage than blue gum. But in areas exposed to wind, blue gum plants apart from being occasionally blown over by the winds develop a curious habit of growth in which the twisting of the stem is clearly noticeable, as for instance the isolated Chenmanguli plantations on the Mysore Road and the avenue trees on that road. Another peculiar form of damage noted in the bluegum areas is the drying up of the top layers of the stem. This may probably be due to the damage of the root system caused by the terrible winds which rudely shake the stems. Winds during fires accentuate the spread and intensity of fires causing great damage.

101. *Frost.*—Frost is of a general occurrence on the west half of the Nilgiri plateau. In the eastern half frost occurs only in certain locations. It kills young Eucalyptus plants. Attempts to plant wattle in grasslands near Mukurti had shown ample evidence of first killing back the young seedlings. Frost covering of young plants is a necessary operation in the early stages of establishment of young plantations. Frost cracks on certain wattle trees causes damage to the bark. Not only frost thwarts attempts at artificial regeneration but it also affects young natural regeneration of the local species. The young grass in the Downs get killed back during the frost season but due to the presence of a network of root stocks they sprout again with the rains of the spring. The establization of the grasslands as a preclimax is mainly due the firm retrograde effect of the frost. The damage due to frost on the young growth is devastating in the Nilgiri plateau mainly due to the wide diurnal range of temperature in the winter months caused by bright sunny days alternating with biting cold nights.

102. *Human agency.*—Much havoc had been wrought to the vegetation by the human hand in the Nilgiris. Fires caused by man wilfully or accidently had arrested the growth of many a forest and had prevented them from marching on to their normal climax, though in some cases it had helped in the creation of a sub-climax most desired by man, as in the case of the teak forests to some extent. Thefts are often of a petty nature and do not reach and alarming proportions as in the densely populated areas in the plains.

103. *Fires.*—On the Nilgiri plateau fires cause a certain amount of damage to plantations adjoining grasslands. The annual burning of grass in Todanad had led to the gradual eating up of the sholas along the periphery with the result that the sholas are found at present nestling in the wrinkles of the undulations or the sheltered folds of the hill, without attempting to be an invasive type of vegetation along its borders. However, such destruction is now at its minimum as the annual firing of the grasslands is done under departmental control and measures to prevent fires reaching the borders of the sholas are forced to be undertaken by the Todas. Though considerably minimized when compared to the past still some damage is done to some shola or other each year due to carelessness or by uncontrollable nature fires on windy days.

104. In Mudumalai range the inflammable material cast down by the deciduous trees offer even an accidental spark the change of developing into an extensive and devastating fire. The dense growth of grass in the dry teak forest and the dry mixed deciduous forests get repeatedly burnt every year. Fires in Mudumalai range are both of internal and external origin. Externally the fires cross over the Mysore State border, from the neighbouring Mysore forests which are annually swept by fires of great intensity. Internal fires are often started more often accidentally chiefly by the wandering Jen Kurrumbers and also by men in collection of honey and other minor forest produce. Incidiary fire caused out of malice or spite against the officials of the Forest department are not very common. Though the fires had helped in the greater recruitment of teak (in areas immune from attack by fire either by natural causes or prolonged effective fire protection the content of teak in the moist deciduous forests had been noticed to be very much less than in the areas usually affected by fire) in most of the areas in the monsoon forests of Mudumalai range, it cannot be denied that the intensity of the

uncontrolled fires especially in the dry areas like the northern parts of Mudumalai range had caused irreparable damage to the growing stock. Though outright killing of trees is not often the result of these raging fires, unsoundness and retarded growth of the stems are very common. Natural regeneration is completely killed though in cases of species like teak which can come up as a fire coppice, it is question of repeated killing back year after year thereby preventing the growth reaching the pole stage in the normal span of years. Repeated fires cause the grasses to get deeply entrenched in the spaces cleared of other growth, thus increasing the future damage by fire ; they have also slowly prevented the closing up of the canopy and caused the gradual hardening up of the soil.

105. In Sigur range the damage caused by fire is serious. The sandal which is the only valuable growth in the area gets killed, as its seedlings are very sensitive to fire. Natural regeneration of the sandal is therefore confined to the spots which escape fire as for example, the vegetation bordering the streams and the ground under dense firehardy bushes. The open jungles which have an impoverished soil due to exposure are made to degenerate further by the hardening and baking effect of the fires on the soil and by the scorching effect on the growing stock.

106. *Omitted.*

107. *Thefts.*—Illicit fellings and removal of firewood are common in the neighbourhood of Coonoor and Ootacamund. *Ieu denticulata and Acacia melonoxylon* trees are lopped for fodder. Theft of deadwood from sholas by the neighbouring villagers are common. The damage to crops by theft is not very serious except in the vicinity of the towns of Coonoor and Ootacamund by virtue of the low density of population in the few villages this division and the scattered nature of the population in the few villages found in the district. For an area of 983 square miles of the Nilgiris district, there are only four towns and about seventy villages. The area under the Forest department is 490 square miles thus covering nearly 50 per cent of the area (though most of it on the plateau are grasslands). Further the population employed in the estates get their fuel requirements from the periodical cutting of the nurse crops and other vegetation in the estates so much as even the sholas adjacent to the estates are not very much destroyed by illicit thefts. It is only in the Badaga country visible signs of the destruction of the sholas are available for they had brought every other piece of land near their hamlets under potato crop during the last decade. The most serious damage done by theft that completely kills the trees is the illicit stripping of bark from the wattle stems in the plantations.

108. *Badaga fellings in sholas.*—Considerable cumulative damage is caused to sholas near villages by the pernicious system whereby Badagas are permitted to collect dry firewood in sholas on a nominal fee of one rupee per annum by each Badaga family.

109. *Animals.*—In Sigur range heavy grazing is one of the factors contributing to the degraded state of the forest. Grazing though not heavy in the Nilgiris plateau is the cause for the damage by fires kindled by graziers for getting a fresh flush of grass in the pasture. Spotted deer, sambhur, pigs and wild sheep cause damage to seedlings and sapplings in the plantation areas. In wattle plantations the valuable bark is occasionally stripped off by deer and sambhur. Complete killing of trees is caused by the circular stripping of the bark near the collar by porcupines in the small wattle plantations in the neighbourhood of the potato fields. Sambhur and wild sheep are also known to nubble the leading shoots of the young seedlings of wattle.

110. *Insects.*—A stem borer (*Phassus malabaricus*) attacks young teak plantations and causes some damage. Round the openings caused by the caterpillar a cankerous growth is formed. Either complete killing of the tree or damage by wind occurs.

111. *Hoplocerambyx spinicornis* (sal borer) is found occasionally attacking Shorea talura trees.

112. *Laccifer lacca* (kusum brood of lac) is found on *Schleichera trijuga* trees of Mudumalai range as the vestige of the past unsuccessful cultivation of lac in that region.

113. A Myloceros beetle is noticed to cause defoliation of wattle plants to a certain extent. The insect also feeds on *Acacia melonoxylon* during October-November.

114. The cottony cushion scale insect (*Icerya purchasii*) has been found on wattle but no serious damage had been noticed. As a result of the work done by the Madras Agricultural Department in 1943, this insect has been more or less controlled by the introduction of a ladybird beetle (*Rodelia cardinalis*). The ladybird beetles after feeding on the scale insects die away for want of food.

115. Young seedlings of wattle in nurseries are damaged by certain cut worms and cockchafer larve. White ants (termites) and certain black weevils have also been found doing damage in the wattle nurseries. All these are however effectively controlled by dusting with gammexene or DDT.

116. *Gummosis.*—Gummosis or gum ' bleeding ' is an obscure pathological condition noticed on the wattles. It is common only on older wattle trees. Trees below six years of age are seldom affected. Gummosis as the name indicates, first manifests itself by the appearance of free exudation of gum through cracks in the bark of the main stem or the branches. Later the areas around the points of exudation become blackened and depressed and in severe cases, most of the bark on the tree may become blackened and valueless. The black mottled bark of the affected tree unless stripped off quickly becomes dry, brittle and useless. Exudation of gum is usually most obvious during and after periods of heavy rainfall and, at such times, pools of gum may be found on the soil at the base of the diseased trees. Affected trees do not always die but their rate of increment in growth is greately reduced and the stripping of the bark is also not very easy. Gummosis is not prevalent to a great extent to cause alarm. The primary cause of gummosis has not yet been established. It might be due to a certain fungal infection causing wood rot in the wattle stems.

117. *Hybridization.*—In the case of wattles the presence of the different species of the wattle cause occasional mixture of strains and certain freaks having peculiar characteristics of different species are found here and there in the plantations. There is room to fear that the more valued of the wattles may hybridize with the ubiquitous *Acacia dealbata* causing inferior strains.

118. *Injurious plants.*—Loranthus has been noticed as a parasite on *Acacia melonoxylon* and *Tectona grandis*. Lantana has taken possession of the ground in dense impenetrable thickets in the young teak plantations affecting the rate of growth of teak in its early stages and also adding to the risk by fire during the hot weather. Some young teak plants are completely smothered by Lantana and eventually lost. In the sandal areas of Sigur Range, Lantana is usually associated with spike. Climbers like *Spatholobus roxburghii* girdle young teak stems in the plantations causing indentation and malformation of the stems. Eupatorium glandulosum colonizes many open patches in thick formations smothering all other growth. In grassland areas wherever it gets a foothold and occupies large patches, it keeps down grass completely and thus reduces the effective area of the pastures.

119. *Spike disease of sandal.*—Spike disease of sandal is endemic in the sandal areas of this division. Mortality due to spike had been noticed in Sigur Range in 1928 and the indications are that the disease is on its spread. In Coonoor Range, spike is spreading in the Burliyar reserve.

120. Damage to young teak plantations in Mudumalai Range is caused by the wild animals present in the area. It is the wild elephants that cause considerable damage in this respect.

CHAPTER III.

UTILIZATION OF THE PRODUCE.

Section 1—Agricultural Customs and Wants of the Population.

121. *General description of the population.*—The Nilgiris is the most sparsely populated district in Madras State. The population consists largely of immigrants from elsewhere. There was a large influx of Tamilians, especially of the backward classes, following the British occupation of the tract. The Nilgiri plateau, however, is the special home of Badagas, Kotas and Todas. The forest tribes of Irulas and Kurubars are found in the lower elevations, the former mostly in Coonoor and Sigur Ranges and the latter mostly in Mudumalai Range. Chettis and Paniyans are common in the Nilgiri-Wynaad. The immigrants of the recent past include Tamilians, Malayalees, Kanarese, Parsis and Muslims. The Nilgiris district is the most polyglot area in the State. Not only do the Badagas, Kotas, Todas and Kurubas speak a tongue of their own, but the plateau stands where three main South Indian languages—Tamil, Malayalam and Kanarese meet. A greater percentage of the population than in other districts can follow the English language.

122. *Badagas* are mainly the agriculturists of the plateau. Mostly they are found in the eastern half of the plateau (except around Kodanad where they are few in number). Though originally they were poor cultivators, they have grown prosperous in the recent past mainly due to immense profits from potato cultivation. In recent times they have become possessors of many tea and coffee estates. The Badagas immigrated to this tract more than four centuries ago from Mysore side. Probably the immigration occurred after the foundation of the Lingayat faith in the latter half of the twelfth century (as many of them are Lingayats) and before the end of the sixteenth century, since in 1602 the Catholic priests from the West Coast who ventured into the plateau found them living side by side with the Todas. The Badaga villages are scattered all over the southern and the easterns portions of the district. The typical village consists of one storeyed houses roofed with red

tiles, each of which possesses a sacred milk room which the women and young boys are forbidden to enter. Round about the villages are the continuously eroded red fields on which mainly potato is raised. The food crops raised by them are samai (*Panicummiliare*), korali (*Setaria glauca*) and wheat. The women do nearly all the cultivation and work very hard. Both sexes of the Badagas may be recognized at a glance, the men by the characteristic white turban and women by their white cloth worn in the fashion of a sarong with a bright red sash round the waist. Divorces and remarriages were common in the early days among the Badagas and the children always went to the husband. Even today the women occupy in important position in the Badaga household and play a vital role in its economy. As far as the forests are concerned the Badaga had always been its enemy and had been responsible for the destruction of many a shola in the past. At present their indiscriminate use of land for potato cultivation is responsible for the disastrous scouring of the soil which takes place each monsoon.

123. The *Kotas* are the musicians and artisans of the hills. They are of a darker complexion than the Badagas and their clothes are often filthy. The women dress very much like the Tamilians and the men can be recognized by their long straight hair, parted in the middle and tied in a bunch behind. Though intelligent and hard working they are held as the lowliest of the low in this tract because they eat carrion. They justify the habit by declaring that when their God Kamataraya made the Todas, Kurubas and Kotas out of three drops of his perspiration, he permitted the first to eat milk and butter, the second meat and the third carrion. They live in thatched huts kept untidy and they are never so sleek as when there is murrian among the Toda buffaloes. Very little is known of their origin but in view of their language being a crude dialect of Kanarese there is room to believe that they hailed from Kollimalai in Mysore.

124. The *Todas* (or Toduvars) claim to be the original inhabitants of the Nilgiri plateau and the lords of the soil. They are purely a pastrol people dwelling in lazy Arcadian fashion in scattered groups of quaint arch proofed huts amidst grass lands. The entrance to the huts is so small and low that it is necessary to go down on all fours to get through it. They are as a rule much taller and fairer than the general run of the inhabitants in South India. In dress, appearance and language they differ widely from their neighbours. They live on the produce of their herds of huge buffaloes and practice unusual customs such as polyandry, female infanticide and buffalo sacrifices at their funerals. The Todas have been the subject of anthropological interest and ethographic enquiry and yet nothing definite is known of their origin in these hills. Similarity in certain customs would indicate that they had migrated from Malabar. It is however certain that the Todas have been the inhabitants of the plateau from time immemorial. Their main homeland is the western half of the plateau amidst the rolling down with vast stretches of grass though in the eastern edge of the plateau they are found at Kodanad. Their hamlets are known as ' Munds '. Their language has the Dravidian stamp and is considered to be allied to Tamil and Malayalam. The Todas had gained the attention of the Government from the early days and numerous reservation of lands in the edges of forests known as ' Toda patta lands ' have been made available for them in the vicinity of their hamlets for the satisfaction of their domestic needs. The Todas are easily recognized by their tall stature, dignified bearing fair complexion and hirsute character (especially the flowing and well groomed beards.) The women are known at a glance by their coiffure ; they wear long side locks which they curl with great care round a stick and smear with butter. The dress of the Todas include an upper mantle of double cloth thrown over the shoulders. They were never known to have practised cultivation. They never do any work except tending their buffaloes and making butter and ghee from the milk. The women are not allowed to have anything to do with the milking or churning but confine themselves to ordinary household duties. As far as the forests are concerned they have never known to have destroyed it and the only demand they make on the forests is the facility for grazing. The population of the Todas have dwindled from 805 in the year 1901 to 630 in 1951 (343 men and 288 women). Had it not been the reservation of the vast stretches of grassland in the Wenlock Downs, it is quite probable that the Todas hedged in between the expansion of tea estates and the growing needs of the Badaga for land to cultivate potatoes would have been forced to change his mode of living due to the curtailment of his pastures. As it is the Todas enjoy free grazing facilities in the grasslands included under forest.

125. The *Irulas* are a jungle tribe and is said to derive their name from the Tamil word ' Irul ' meaning darkness, which may refer either to the gloomy jungles they live in or to their very swarthy complexions. They are found chiefly on the easterm lower slopes in hamlets known as ' mottas ' formed of huts made of plaited bamboo plastered over with mud. They cultivate patches of ragi, samai, tenai, dhall, maize and castor and also grow plantains, jack, lime and other fruit trees. They have been known to have done shifting cultivation clearing forest growth. They also earn by collection of minor forest produce such as honey, gum and dyes. They have no dealings with the people of the plateau and dispose of their produce in the Mettupalayam market. They keep cows, and like the

Todas and the Badagas, prohibit their womenfolk from having anything to do with milk. The Irulas on the Bhavani valley are known as Muddumars and those about Masinagudi as Kasabas. The Irulas as a whole are small in stature, dark in complexion broad nosed and resemble to an extent the Kurubas. The language of the Irulas are akin to Tamil. Efforts have been to settle them in the forest areas and many forest settlements of Irulas exists in the division. They have a headman called 'Pattakaran' and a deputy styled 'Kolkaran' who preside at panchayats.

126. The *Kurubars* are a jungle tribe said to be the descendants of Pallavas who were overthrown by the Cholas about the ninth century, and made to flee to the wilds. Apart from the Kurubas who live on the plateau, there are other classes of Kurubas in this district. They are the Ur Kurubas near Nillilam, and the Jen Kurubas or Shola Nayakas who are numerous in the Nilgiri-Wynaad especially on the Mudumalai side of it, and Bet Kurubas (wood-cutting Kurubas) found in fair numbers in the Nilgiris-Wynaad. The Kurubas of the plateau live in hamlets known as 'mottas or kambais' situated on the slopes of the hills and consisting of small huts made of wattle and mud and thatched with grass. From the fact that there are many places having names with the suffix 'kambai' it is evident that in the past there were many Kuruba settlements on the hills. The Kurubas are short, slightly built, dark complexioned and to some extent resembles the Irulas. Their language appears to be a mixture of crude Tamil and Kanarese. The Kurubas are noticeable from their wiry and curly hair, which sticks up all round their heads like a black halo and the women from their one garment—a cloth passed straight across the breasts, tied under the arms and reaching down to their knees. They subsist in much the same way as the Irulas. The Ur Kurubas near Nannilam are a more civilized community, who speak Kanarese and are immigrants from Mysore. The Jen Kurubars are so called on account of their skill in collecting honey (jenu) from wild bee hives on cliffs and precipices. They clamber down at night with the help of ratten ladders. They prefer to be called Jennu Koyyo Shola Nayakas (honey collecting lords of the woods) or Shola Nayakas for short. They live in the depths of the jungles in bamboo huts thatched with grass. Much of the unskilled work in Mudimalai Range is done by Jen Kurubas. The Bet Kurubas who are a distinct community speak a dialect which is an odd mixture of Tamil, Kanarese and Malayalam and they do not intermarry with the Jen Kurubas. They provide much of the skilled labour in Mudumalai Range which includes elephant work.

127. The *Chettis* of the Wynaad found in this district have no connection with the Chetti traders of the Tamilnad and the Telugu country. They resemble physically the Nayars and Tiyars of Malabar, being fair skinned, straight featured, wearing their top-knots hanging over one side of their foreheads and living in neat little houses after the Malabar pattern, made of woven thattis covered with smoothened earth decorated with wide pials and patterns and figures of animals done in chunam, provided with wide pials and deep caves, and surrounded by trim, fenced fruit garden. Though outwardly alike there are two separate castes among them, namely, the Mandadan Chettis and the Wynaadan Chettis. The Mandadan Chettis are common in the country between Nellakottai and Teppakadu. They speak corrupt Kanarese, follow the Makkatayam law of inheritance and seem to have been always the natives of Wynaad. The Wynaadan Chettis say they were originally Vellalas from Coimbatore. They speak Malayalam, follow Marumakkatayam. The two communities do not intermarry and their womenfolk will not even mess together. The Chettis are mainly landowners and practise agriculture with the help of their farm labourers known as 'Paniyan.'

128. The *Paniyans* are a short, dark skinned tribe with broad noses and curly hair. They are the main farm labourers of the Chettis. Each family is attached to a certain Chetti household and works in its fields, and in the past they were a little better than agrestic slaves. The advent of the planters did much to alleviate their position but they are still a poor class unkept and unclean. They speak a corrupt patois of Malayalam, live in dirty little huts made of bamboo wattle plastered with mud and thatched with grass and follow the Makkatayam law of inheritance. They are used in connexion with some of the works of Mudumalai Range.

129. *The wants of the population.*—The main requirements of the local population from the forests of this division are (1) firewood, (2) timber and (3) facilities for grazing and penning of cattle.

130. *Firewood.*—The principal demand for firewood is from the towns of Ootacamund, Coonoor and Kotagiri. Nearly a third of the requirements of the local population in and around Ootacamund and Coonoor are met from Government plantations. The private plantations contributed a great deal to the firewood market, but of late their output had been considerably reduced due to rapid exploitation and conversion of their small plantations into potato fields. The poor class of the public experience great difficulty in obtaining their requirements of firewood from the open market, so much so relief shops

at Ootacamund and Coonoor had to be opened for few years so that the poor may get the fuel at a fair price. The paucity of firewood would indicate the necessity of greater production of the favoured blue gum. The scarcity for firewood in Coimbatore is likely to develop an export trade of fuel from the eastern part of the Nilgiris. There is no demand for fuel in Mudumalai Range. A small demand exists in Sigur Range mainly due to the concentration of a floating population connected with the execution of the Moyar Hydro-Electric Project. There is, however, a small demand always at Masinagudi. On the plateau, due to large scale raising of potatoes most of the tree of shrub growth outside the limits of the reserves have been destroyed and the Badagas are making heavy demands on the sholas under the cover of the pernicious Badaga Fuel Permit System. Small village plantations may be necessary to meet their demands and to save the sholas from destruction.

131. *Timber.*—Where large-sized blue gum trees are available from private sources from the neighbourhood, it is locally used for rough constructional works. But the demand is small because the blue gum timber is not very much valued due to its degrade in use. However the small demand for its timber is always present as it is locally available and cheaper than the other timber which have to be imported from the plains. For good quality timber work, teak, mathi, pillamarudu, venteak and vengai are often used and mainly obtained from Malabar.

132. *Grazing and penning of cattle.*—On the Nilgiri plateau the Todas who are a pastoral race practice grazing with great regularity. They depend for their livelihood on their buffloes. They also move their cattle to the Kundahs for a part of the year. This migratory custom would appear to approximate to a form of rotational grazing. The cattle from a particular mund in the plateau always move to the same pen or set of pens in the Kundahs, where they stay for three or four months from February to May. The provision of grazing facilities for the Todas involves burning of grass lands around the munds and elsewhere. The Badagas also graze their cows and buffloes in the reserves and pen their cattle in the Kundahs. The Badaga cattle pens are known as 'hundis'. Badagas living in Ebbanad, Tuneri, Bikkapathimund and other villages north of Doddabetta, pen their cattle for a part of the year in Sigur Range. The reserves of Sigur Range are also grazed by the cattle of the local population. There is very little grazing in Mudumalai Range.

Section 2—Markets and marketable products.

133. *Markets.*—The markets for firewood and charcoal in the Nilgiri plateau are the towns of Ootacamund, Coonoor and Kotagiri. There is a keen demand for firewood from the Government plantations as the private sources have dwindled either due to conversion of their small plantations into potato fields or the rapid exploitation of the private plantations during the war years. There is a tendency to export fuel to the plains of Coimbatore whenever the market there is attractive.

134. There is no market for timber within the district itself except for the small percentage of the outturn which is locally consumed. The natural outlet for the bulk of the timber of this division, which is exploited from Mudumalai Range, is towards Mysore. The Mudumalai teak and other valuable timber is disposed of at Nanjangode in Mysore territory. Nanjangode is about 45 miles from Kargudi, the headquarters of Mudumalai Range. The less valuable stock consisting of poles and logs with major defects is disposed of locally but eventually they are taken by the merchants towards Mysore. It is not profitable to take to the West Coast markets even the best variety of Mudumalai timber as the lead is long and the quality of timber relatively low.

135. The sandalwood produced in this division is sent to Satyamangalam in Coimbatore North Division for sale.

136. The bamboos exploited in this division on the eastern slopes are taken down to Mettupalayam by the contractors and thence consigned to various markets in the plains.

137. There is also no local market for the wattle bark produced in this division and it is taken to the different tanning centres in the south. There is, however, a good demand for the wattle bark of this division as it is one of the two divisions in which the wattle is raised on a large scale.

138. *Marketable products.*—The marketable products of the division are the following :—

(i) *Timber.*—Except for the blue gum timber which is available in small quantities in the plateau from scattered old trees in the plantations, the entire outturn is from Mudumalai Range. The most valuable timber produced is teak. Other timber that are usually exploited are rose wood, venteak, vengai, mathi, *Grewia tiliaefolia* and *Ougenia dalbergioides* are occasionally cut when there is demand.

(ii) *Firewood.*—The most favoured firewood on the hills is the blue gum. The wattle firewood is also used and it has yet to get the popularity it deserves from the people who have long been accustomed, to the blue gum. The hardwood Eucalyptus which

have shown no promise in the Nilgiris for producing good timber is now being gradually replaced by the bluegum and the firewood obtained from the cleared hardwood eucalyptus areas are also marketed as firewood.

(iii) *Sandalwood.*—The dead sandal in Sigur and Coonoor Ranges are collected and sold. The bulk of the sandalwood comes from Sigur Range. The approximate annual output of the division will be 33 tons, of which only about 3 tons will be from Coonoor Range. However as the extraction of the sandal depends on its mortality, the annual outturn is variable.

(iv) *Bamboos.*—Both *Dendrocalamus strictus* and *Bombusa arundinacea* are available, the former being the predominant species on the eastern slopes of the Nilgiris. *Bambusa arundinacea* is available in good quantities in Mudumalai Range but has no market for organized exploitation. There is little demand for the scattered bamboos in Sigur Range.

(v) *Wattle bark.*—The bark obtained from the black wattle *Acacia mollissima* is one of the important forest produce of the division.

(vi) *Minor forest produce.*—The principal items of minor forest produce collected are honey, wax, horns, gallnuts, shekoy, avaram bark, jonnal bark, tamarind, stone moss and tree moss. Other items are vembadam bark, date leaves, korai grass, soapnuts, pungam seeds, neem seeds, wild saffron, wild ginger, canes kongu fruits, elavam fruits and nux vomica. *Gaultheria fragrantissima* (oil of wintergreen) and *salamisiri* (Orchis mascula) on the plateau and lemon grass in Mudumalai Range are also available but are not systematically exploited. Bluegum leaves are sold for the distillation of the eucalyptus oil.

(vii) *Pyrethrum flowers.*—A limited amount of pyrethrum flowers are cultivated mainly to meet the needs of various Government institutions. There is not a great demand for this insecticide in the open market as there was in the days of the last war and before the synthetic preparations began to hold their sway in the market.

Section 3—Lines of export.

139. The only railway in the district is that from Mettupalayam to Ootacamund. Transport charges on this hill railway are high and it plays very little part in the transport of the forest produce.

140. The plantations of the plateau are well served either by public roads or those maintained by the department. The plantations themselves usually contain a net work of internal fair weather roads. Motor transport is often used for the extraction of firewood from the plantations to the consuming centres in the plateau. Practically no firewood from the departmental plantations is carried down to the plains, though of late certain private woods are exploited along the eastern slopes for transport by road to Mettupalayam. The main roads leading to the Coimbatore district from the plateau are the Mettupalayam-Ootacamund and Kotagiri-Mettupalayam roads. Bamboos extracted in the coupes on the eastern slopes whenever possible are transported by lorries along the lower portions of these roads. Wattle bark from the plateau is also transported by lorries to Mettupalayam and thence consigned to various tanneries.

141. The transport of timber from Mudumalai Range to Nanjangode is done along the Gudalur-Mysore Road by means of lorries. Occasionally such timber that may be required in the plateau is brought up to the hills by lorries along the Ootacamund-Gudalur road. Over part of the tract motor transport is used for the transport of sandalwood from Sigur Range to Satyamangalam.

142. For Mudumalai and Sigur Ranges the principal route of export is the Ootacamund-Mysore road. Though some lorry tracks and roads are available within Mudumalai Range, they can be used only in fair weather. In Sigur Range apart from the road running from Teppakadu to Moyar and the less used Sigur Ghat road to Ootacamund, most of the areas in the range can be reached only by footpaths.

Section 4—Methods of exploitation and their costs.

143. *Timber.*—Timber is felled in Mudumalai Range departmentally and the volume is calculated by the Quarter-Girth formula $[(\frac{1}{4}g)l \times ^2]$ Volume, where girth is the mid-girth of the log and l is the length of the log. Logs are dragged to the roadside depots by the departmental elephants and thence removed by lorries. The better class of timber is transported to Nanjangode depot for being sold along with the timber of Wynaad Division. The inferior timber not fit for transport to Nanjangode and teak poles from thinnings are sold locally. The timber commonly extracted are *Tectona grandis, Dalbergia latifolia, Pterocarpus marsupium, Lagerstroemia lanceolata, Terminalia-tomentosa* and *Grewia tiliaefolia.* Among the timber extracted at present only rosewood is roughly squared before it is transported.

144. The classification and grading of timber is done as follows :—

Teak.—(i) T.R. (Teak round, 'A' class). Straight and sound logs 8 feet and up in length.

T.R. I.—Sixty inches and up in mid-girth.

T.R. II.—Forty-eight inches to 59 inches in mid-girth.

T.R. III.—Thirty-five inches to 47 inches in mid-girth.

(ii) *T.R.B.* (Teak round, 'B' class). Logs 8 feet and up in length with minor defects.

T.R.B. I.—Sixty inches and up in mid-girth.

T.R.B. II.—Forty-eight inches to 59 inches in mid-girth.

T.R.B. III.—Thirty-six inches to 47 inches in mid-girth.

(iii) *T.R.C.* (Teak round, 'C' class). Logs 8 feet and up in length not qualifying for the A and B classes. Usually logs with bad shape and major defects fall under this class.

T.R.C. I.—Sixty inches and up in mid-girth.

T.R.C. II.—Thirty-six inches to 59 inches in mid-grith.

(iv) *T.R.S.L.*—(Teak round short logs). Logs between 4 feet and 7 feet 9 inches in length and 36 inches and above in girth.

(v) *T.P.*—(Teak poles). T.P.I. and T.P. II classes are measured as in the case of logs. But in the case of T.P. III, T.P. IV, T.P.C. and T.P.U.S. classes a standard volume of 2 cubic feet, 1·5 cubic feet, 1 cubic foot and 0·75 cubic foot respectively is adopted for accounting purposes.

T.P.I.—Teak poles 15 feet and up in length and 24 to 35 inches in mid-girth.

T.P. II.—Teak poles 10 feet to 15 feet in length and 24 to 35 inches in mid-girth.

T.P. III.—Teak poles 15 feet and up in length and 12 to 35 inches in mid-girth.

T.P. IV.—Teak poles 10 feet to 15 feet in length and 12 to 35 inches in mid-girth.

T.P.C.—Teak poles 12 to 35 inches in mid-girth and not qualifying to any of the four classes mentioned above.

T.P.U.S.—Teak poles undersized 10 feet and up in length, 9 inches in mid-girth.

NOTE.—Teak logs are not rough squared at present. If they are squared, the corresponding classes will be T.A. I, T.A. II, T.A. III, T.B. I, T.B. II, T.B. III, T.C. I and T.C. II according to the girth and length specifications given for the round logs detailed above.

Rosewood.—Rosewood logs are rough squared before transport. The different classifications followed are as follows :—

R.W.A. I.—Straight and sound logs 8 feet and up in length and 60 inches to and above in mid-girth.

R.W.A. II.—Straight and sound logs 8 feet and up in length and 48 inches to 59 inches in mid-girth.

R.W.B. I.—Logs 8 feet and up in length with minor defects and 60 inches and above in mid-girth.

R.W.B. II.—Logs 8 feet and up in length with minor defects and 48 inches to 59 inches in mid-girth.

R.W.C.—Logs not qualifying to the above classes due to major defects ; 8 feet and up in length and 48 inches and up in mid-girth.

R.W.P.A.—Sound poles 8 feet and up in length and 25 inches to 47 inches in mid-girth.

R.W.P.B.—Poles 8 feet and up in length, 25 inches to 47 inches in mid-girth and not qualifying for R.W.P.A. class.

Other hard woods.—Timber other than teak and rosewood.

A class.—Straight and sound logs 8 feet and up in length and 48 inches and up in mid-girth.

B class.—Logs 8 feet and up in length and 48 inches and up in mid-girth but not qualifying for the A class.

Poles.—Straight and sound poles 8 feet and up in length and 36 inches to 47 inches in mid-girth.

145. *Firewood.*—On the plateau the felling, billeting and stacking in 'Lots' are done by the contractors who purchase the coupes in open auction. In Ootacamund North and South Ranges, the custom is to cut the firewood into billets 3 feet long and to stack the billets into 'lots' measuring 8 feet × 5 feet × 3 feet. A freshly stacked lot thus measures 120 cubic feet but the contractors usually deliver to the market at 96 cubic feet per lot, allowing for dryage and loss of bark. Approximately a freshly stacked lot may weigh as much as 4,800 pounds and when fit for consumption about 4,000 pounds. In Coonoor Range, the lots are made of 1½ feet billets but the stacks are of the same dimensions. The firewood is delivered in 'lots' of 96 cubic feet to the market.

146. The bluegum plantations allotted for a year were sold in the years following World War II in two sets, one set of coupes being earmarked for supplies by the contractors to the relief shops in Ootacamund and Coonoor at a rate specified at the time of sale so that the poorer classes of the public may obtain their requirements in these retail shops at a fixed rate. The rate for selling to the public was 4 annas a maund and the contractors were expected to deliver to the relief shops a lot of 96 cubic feet at Rs. 20 at Ootacamund and at Rs. 22 at Coonoor. The other set of coupes were sold without the condition binding supplies to relief shops and the fuel from them was free to be disposed of in the open market. The system of relief shops ceased in the year 1952.

147. *Sandalwood.*—All operations connected with sandalwood are carried out departmentally. The sandal collected is rough cleaned and sent to Satyamangalam depot in Coimbatore North Division for sale. The final cleaning of the sandalwood is done at Satyamangalam. The extraction of sandalwood is regulated by the Sandalwood Working Rules (also known as the Javadi Rules).

148. *Minor forest produces.*—All minor forest produce is disposed of by selling the right to collect by the contractors except deer and sambhur horns in Mudumalai Range and honey, wax, deer horns and sambhur horns in certain areas of Sigur Range. The idea in collecting the horns departmentally is to ensure that the collection is confined only from the remains of dead animals. In Sigur Range, honey and wax are collected only from certain specified areas excluded from the general minor forest produce contract. The honey collected departmentally are transported to Ootacamund South Range office and then disposed according to the instructions received from the Forest Utilization Officer. If they are not required by him for want of indents on him, the produce is sold locally.

149. *Bamboos.*—All bamboos from the coupes on the eastern slopes are worked through the agency of contractors. Bamboos in Mudumalai and Sigur Ranges not included in the bamboo coupes are at present sold on permits whenever there is demand. Both *Bambusa arundinacea* and *Dendrocalamus strictus* are available and extracted from this division.

150. *Wattle bark.*—The wattle plantations are sold standing to the contractors who peal the bark, dry them and despatch the bark to the tanning areas. The firewood obtained from the felled wattle is disposed of by the contractors locally.

151. *Cost of collection of produce—Timber.*—In Mudumalai Range, for extraction of timber, the following rates are paid by the department—

Felling and conversion of timber :—

(i) For round logs—Re. 0–1–8 per cubic foot.

(ii) For squared logs—Re. 0–3–0 per cubic foot (only rosewood logs are rough squared before transport).

(iii) Making of drag-holes for big logs—Re. 0–1–0 per hole.

(iv) *Dragging to roadside depot.*—This is done entirely by the departmental elephants. The cost of dragging per cubic foot is arrived at by dividing the expenditure incurred in the feed and upkeep of the elephants by the number of cubic feet dragged during the period in question. The following are some of the figures obtained from the half-yearly returns :—

		RS.	A.	P.
For the half-year ending	31st March 1949	0	3	7
Do.	24th September 1949.	0	5	6
Do.	31st March 1950	0	2	11
Do.	31st March 1951	0	5	11
Do.	24th September 1951.	0	4	3
Do.	31st March 1952	0	2	10

In the calculation of the above rates, the resting period of the elephants and the pay of elephant attendants are included. On an average the dragging, to the roadside depot would be Re. 0–4–2 per cubic foot based on the figures given above.

(v) *Transporting to Nanjangode Depot.*—This is done by the contractors on the basis of tenders. The following are some of rates paid in the recent past for the lorry transport of timber from the forest depots near the felling areas to Nanjangode :—

From Selection Felling Area (about 60 miles lead)—Re. 1–1–0 per foot.

From Clear Felling Area (about 52 miles lead)—Re. 1 per foot.

152. *Sandalwood.*—The rates paid by the department for the collection and transport of sandalwood to Satyamangalam are given below :—

(i) *Marking of dead trees.*—A lump sum of Rs. 150 is sanctioned for each coupe both in Coonoor and Sigur Ranges. Labour is employed to locate the dead trees and the foresters do the marking.

(ii) *Uprooting and rough cleaning.*—A rate of 12 annas a quarter is paid for uprooting and rough cleaning at stumpsite.

(iii) *Transporting to the forest depot.*—This depends upon the lead and on an average a rate of Rs. 5 per ton per mile is paid.

(iv) No final cleaning is done in this division.

(v) *Transport from Forest Depot to Satyamangalam.*—The rough cleaned wood is transported by lorries from the Forest Depot to Satyamangalam Sandalwood Sale Depot in Coimbatore North Division, where the final cleaning of sandalwood is done before sale. The rates for the transport of sandalwood from the Forest Depots to Satyamangalam depend upon the tenders received every year. The following are some of the rates paid in the recent past :—

From Masinagudi to Satyamangalam—Rs. 53 per ton.

From Burliyar to Satyamangalam—Rs. 28 per ton.

When transport has to be done from remote areas by bullock carts it costs about Rs. 60 per ton for a lead of 7 miles.

(vi) Reforming of the rough cleaned wood in the depots for inspection by the District Forest Officer or the Ranger—A rate of Re. 0–0–6 per quarter is in vogue.

(vii) *Other expenditure.*—Final cleaning charges and other incidental expenditure incurred at the Sale Depot at Satyamangalam are paid for by inter-divisional book adjustment on receipt of the bill from the District Forest Officer, Coimbatore North Division. Recently on an average it had cost Rs. 30 per ton. For a depot watcher in Sigur Range employed for a period of six months in a year, a pay of Rs. 12 per month and a dearness allowance of Rs. 18 per month is paid.

153. *Minor forest produce.*—In Sigur Range, for the departmental collection of the minor produce, the following rates are paid :—

(i) Honey—Re. 0–4–0 per pound.

(ii) Wax—Re. 0–8–0 per pound.

(iii) Sambhur and deer horns—Re. 0–1–6 per pound.

In Mudumalai Range only deer and sambhur horns are collected departmentally and they are paid for at a rate of Re. 0–3–6 per pound.

Section 5—Past and current prices.

154. Statements showing the prices realized for the various items of forest produce are given below :—

(*a*) *Timber.*—The prices obtained for the various classes and grades of timber from Mudumalai Range, since the existing classification (vide paragraph 144) came into being in this division, are as follows :—

Species.	*Class of timber.*	*Average price per cubic foot of timber and of poles obtained during the year.* 1949–50. RS. A. P.	1950–51. RS. A. P.	1951–52. RS. A. P.
Tectona grandis (Teak)	T.R. I	10 6 0	10 2 0	13 11 0
	T.R. II	8 4 0	6 4 0	9 6 0
	T.R. III	6 5 0	5 11 0	12 2 0
	T.R.B. I	9 7 0	9 14 0	9 15 0
	T.R. B. II	7 10 0	7 9 0	10 4 0
	T.R.B. III	5 13 0	6 1 0	7 7 0
	T.R.C. I	..	9 12 0	9 1 0
	T.R.C. II	5 10 0	6 8 0	6 15 0
	T.R.S.L.	..	..	7 10 0
	T.P. I	3 9 0	3 6 0	3 3 0
	T.P. II	3 11 0	3 8 0	2 15 0
	T.P. III	..	1 0 0	1 8 0
	T.P. IV.	..	0 5 0	1 4 0
	T.P.C.	3 8 0	1 8 0	2 1 0
	T.P.U.S.	..	0 5 0	0 6 0
	T.A. I	10 11 0	11 10 0	14 0 0
	T.A. II	7 8 0	8 15 0	..
	T.A. III	9 3 0	6 12 0	..
	T.B. I	9 1 0	10 12 0	8 0 0
	T.B. II	7 7 0	9 12 0	..
	T.B. III	7 3 0	6 12 0	..
	T.C.I	..	..	..
	T.C. II	5 15 0	6 2 0	..
Dalbergia latifolia (Rosewood)	R.W.A. I	8 15 0	17 11 0	8 1 0
	R.W.A. II	5 11 0	..	8 0 0
	R.W.B. I.	3 15 0	10 7 0	7 9 0
	R.W.B. II	3 12 0	7 1 0	6 12 0
	R.W.C.	2 13 0	7 10 0	5 13 0
	R.W.P.A.	1 9 0	..	1 11 0
	R.W.P.B.	1 8 0	0 15 0	..

Species.	*Class of timber.*	*Average price per cubic foot of timber and of poles obtained during the year* 1949–50.	1950–51.	1951–52.
		RS. A. P.	RS. A. P.	RS. A. P.
Terminalia tomentosa (Mathi) ..	M.R.A.	3 2 0	3 4 0	3 15 0
	M.R.B.	1 8 0	2 4 0	3 1 0
	M.P.	1 5 0	0 10 0	1 7 0
Lagestroemia lanceolata (Venteak).	V.T.R.A.	..	3 7 0	3 2 0
	V.T.R.B.	..	2 5 0	3 8 0
	B.T.R.	..	..	..
Pterocarpus marsupium (Vengai).	N.R.A.	3 4 0	..	3 10 0
	N.R.B.	1 14 0	..	2 5 0
	N.P.	1 9 0	0 12 0	1 9 0
Grewia tiliaefolia (Thadasu) ..	G.R.A.	2 1 0	2 2 0	2 15 0
	G.R.B.	1 0 0	2 4 0	2 9 0
	G.P.	..	..	1 5 0
Other hardwoods	H.R.A.	..	4 15 0	5 13 0
	K.R.B.	3 8 0	3 12 0	4 9 0
	H.P.	2 3 0	2 1 0	1 8 0

(*b*) *Firewood* (*Bluegum*).—Bluegum plantations are sold standing to contractors who fell the trees and dispose of the fuel through labour employed by them.

The rates fetched for the different Bluegum Felling Series vary and they are given in the following statement :—

Statement of prices obtained for firewood (bluegum) in the different felling series of the Nilgiris Division.

Name of felling series. (1)	*Price obtained per acre of blue gum plantation from 1938–39 to 1951–52. In rupees.* 1938–39. (2)	1939–40. (3)	1940–41. (4)	1941–42. (5)	1942–43. (6)	1943–44. (7)	1944–45. (8)
1 Aramby	279	363	444	185	184	402	314
2 Cairnhill	178	361	222	278	392	471	453
3 Governershola	77	180	66	138	235	375	197
4 Snowdon	225	93	94	171	479	552	400
5 Muthinad	..	..	..	..	..	516	504
6 Coonoor Peak	387	391	277	1,701	509	468	519
7 Bandyshola	140	107	554	1,936	752	339	234
8 Rallia	..	..	..	..	..	527	478
9 Teppakuchi	..	..	..	..	..	..	..

Name of felling series.	*Price obtained per acre of bluegum plantation from 1938–39 to 1951–52. In rupees.* 1945–46. (9)	1946–47. (10)	1947–48. (11)	1948–49. (12)	1949–50. (13)	1950–51. (14)	1951–52. (15)
1 Aramby	418	443	312	598	497	901	900
2 Cairnhill	488	..	560	464	368	1,185	2,200
3 Governershola	..	139	289	327	210	..	532
4 Snowdon	298	297	1,414	1,434	..	..	..
5 Muthinad	340	565	215	1,588	..	..	968
6 Coonoor Peak	452	527	..	1,213	636	1,246	1,000
7 Bandyshola	1,751	599	435	1,355	..	616	1,000
8 Rallia	..	469	525	1,140	1,000	966	934
9 Teppakuchi	..	..	..	..	..	..	..

(*c*) *Wattle.*—The wattle plantations are sold standing to the contractors who exploit both the tanning bark as well as the firewood. The price fetched per acre for the wattle plantations, therefore, include both the value for firewood and bark. The price fetched for the wattle plantations sold in this division are given below.

Locality.	Average price fetched in rupees per acre for wattle plantations in the years. 1948–49.	1949–50.	1950–51.	1951–52.
1 Blackheath	1,211	900	1,614	..
2 Happathi	..	..	1,140	..
3 Lovedale	..	..	1,160	..
4 Marliamund	..	..	945	..
5 Cairnhill	..	..	1,800	..
6 Kothiben	..	..	976	781
7 Kokothorai	..	..	1,084	332
8 Gudakalahalla	..	..	1,120	178
9 Sullicode	..	..	..	501
10 Araihatti	..	..	..	586
11 Karpagam	..	..	..	467
12 Aramby	..	..	..	720
13 Yedakad	..	..	..	316
14 Sim's park	..	..	..	640
15 Mokkai	..	..	..	1,600
16 Pillurshola	..	..	..	1 000
17 Curzon Valley Plot I	..	..	..	150
18 Do. Plot II	..	..	..	40
19 Kannerahoda	..	..	..	1,770

(*d*) *Sandalwood.*—The statement showing the total annual yield of sandalwood from the Nilgiris Division and the revenue realized in the year by sale of either the whole or part of the total yield is given below for the period 1938–39 to 1951–52.

Year.	Total yield of sandalwood produced in the division. TONS.	CWT.	QRS.	LB.	Total revenue realized by sale of part or whole of the sandalwood extract. RS.
1938–39	73	3	3	5	37,366
1939–40	31	13	0	10	20,635
1940–41	42	10	1	20	25,292
1941–42	38	18	0	3	41
1942–43	19	6	0	20	29,086
1943–44	26	2	1	8	34,015
1944–45	26	5	2	26	23,778
1945–46	15	18	3	14	33,987
1946–47	14	8	1	27	58,681
1947–48	20	6	1	5	28,199
1948–49	46	17	2	9	6,440
1949–50	65	11	2	17	2,47,200
1950–51	57	5	2	22	1,99,962
1951–52	47	19	1	5	1,25,499

The actual quantity of sandalwood sold in Satyamangalam depot from the Nilgiris Division stock from 1948–49 to 1951–52 and the prices obtained therefor are given below :—

Year of sale.	Actual quantity of sandalwood sold. TONS.	CWT.	QRS.	LB.	Total price obtained. RS.	A.	P.	Average rate per ton. RS.
1948–49	1	18	2	26	6,342	12	0	3,274
1949–50	72	7	1	26	2,47,084	0	0	3,414
1950–51	44	7	3	20	1,99,962	4	0	4,531
1951–52	41	18	2	18	1,25,499	0	0	2,933

(*e*) *Bamboos.*—The revenue obtained by the sale of the two annual bamboo coupes of the division is as follows :—

Year.	Revenue by the sale of the two bamboo coupes of the division. RS.	Year.	Revenue by the sale of the two bamboo coupes of the division. RS.
1938–39	1,540	1945–46	2,400
1939–40	980	1946–47	4,000
1940–41	1,000	1947–48	4,000
1941–42	1,310	1948–49	4,000
1942–43	1,487	1949–50	2,093
1943–44	2,175	1950–51	1,639
1944–45	2,180		

(*f*) *Minor forest produce.*—The revenue obtained by the sale of the minor forest produce in the various ranges of the division are given below :—

Year.	Revenue realized in rupees.			
	Ootacamund North and South.	Coonoor Range.	Mudumalai Range.	Sigur Range.
1941–42	* 965	565	..	..
1942–43	* 1,005	1,571	..	..
1943–44	* 1,028	2,531	76	..
1944–45	* 870	2,145	90	..
1945–46	* 2,050	3,343	1,250	..
1946–47	* 5,000	1,145	6,250	..
1947–48	* 100	3,500	1,725	..
1948–49	5,300	3,200	7,000	..
1949–50	1,400	4,500	7,650	4,610
1950–51	1,500	4,500	6,260	5,800
1951–52	905	4,005	2,755	5,050

* Includes minor forest produce revenue from Sigur Range also as the Sigur and Ootacamund ranges then formed one lease unit.

(*g*) *Grazing.*—The revenue obtained by the sale of permits to different kinds of cattle for grazing in the various ranges of the division is given below :—

Year.	Revenue obtained from				
	Ootacamund North Range.	Ootacamund South Range.	Coonoor Range.	Mudumalai Range.	Sigur Range.
	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.	RS. A. P.
1944	1,431 2 3*	..	734 4 3	93 6 9	898 10 6
1945	1,266 5 3*	..	789 3 6	71 9 9	887 1 5
1946	1,273 1 6*	..	782 0 9	61 1 0	940 4 0
1947	1,445 15 3*	..	876 7 6	82 1 0	818 12 0
1948	1,278 9 9*	..	647 1 0	815 7 11	54 4 6
1949	1,402 11 0*	..	753 13 0	821 14 9	139 12 6
1950	155 7 6	1,356 3 9	733 8 8	983 6 3	70 12 6
1951	707 1 0	776 5 6	566 3 9	1,023 7 6	126 0 0

* Relates to the old unbifurcated Ootacamund Range.

CHAPTER IV.

STAFF AND LABOUR SUPPLY.

Section 1—Staff.

155. The establishment of the Nilgiris Division includes (i) the staff attached to the District Forest Office and (ii) the staff attached to the different ranges. The details of the sanctioned strength in 1952 are given below :—

Name of post.	*Strength.*		
	Permanent.	*Temporary.*	*Total.*
(i) District Forest Office—			
District Forest Officer	1	..	1
Head clerk	1	..	1
Upper division clerks	1	2	3
Lower division clerks	5	1	6
Typist	1	..	1
Draughtsman	1	..	1
Peons	4	..	4
(ii) Ranges—			
Ootacamund North Range—			
Rangers	..	1	1
Foresters	1	2	3
Forest guards	11	..	11
Reserve watchers	..	10	10
Range clerks	..	2	2
Peons	..	1	1
Ootacamund South Range—			
Rangers	1	..	1
Foresters	1	5	6
Forest guards	10	3	13
Reserve watchers	..	4	4
Bungalow watchers	..	1	1
Sweeper (Forest Colony)	..	1	1
Range clerks	1	1	2
Peons	1	..	1
Coonoor Range—			
Rangers	1	..	1
Foresters	3	..	3
Forest guards	23	..	23
Reserve watchers	..	8	8
Range clerks	1	1	2
Peons	1	..	1
Mudumalai Range—			
Rangers	1	..	1
Foresters	5	..	5
Forest guards	14	..	14
Bungalow watcher	..	1	1
Water cartman	..	1	1
Range clerks	2	..	2
Peons	1	..	1

Name of the post.	Strength. Permanent.	Temporary.	Total.
(ii) Ranges—*cont.*			
Sigur Range—			
Rangers	1	..	1
Foresters	1	..	1
Forest guards	7	..	7
Reserve watchers	..	4	4
Bungalow watchers	..	1	1
Sandalwood depot watcher (six months in a year).	..	1	1
Range clerks	1	..	1
Peons	1	..	1

The Nilgiris Forest Division thus includes in its establishment 1 District Forest Officer, 1 head clerk, 3 upper division clerks, 15 lower division clerks, 1 typist, 1 draughtsman 9 peons, 5 rangers, 20 foresters (two kept vacant), 73 forest guards (five kept vacant), 23 reserve watchers, 3 bungalow watchers, 1 sandalwood depot watcher and 1 sweeper for the Forest Colony at Bishop Downs.

Section 2—Labour supply.

156. There is scarcity of labour for the forest work over the entire tract. The expansion of Hydro-Electric Schemes, the cultivation of potato on a large scale and the more attractive wages paid by others create enormous difficulties in the matter of the procurement of sufficient and efficient labour for any of the forest works both on the plateau and on the lower slopes. In Mudumalai Range, the resident population of Kurubas and Paniyans are employed in some work or other of the Forest Department. Some of them are employed in elephant work. Bet Kurubas who are skilled in felling and converting timber are employed both for felling work and tuckle cultivation. Nowadays skilled axe-man from Malabar are also easily available for employment. Jain Kurubars are skilled in the collection of honey and other minor forest produce, though at present the departmental collection of minor forest produce is limited to very few items like collection of sambhur and deer horns. They are used in fire protection work also. It may be stated without any mental reservation that the entire working of the Mudumalai Range depends on the small force of the jungle tribe of Kurubars and the locally available farm labourers called Panniyans. In Sigur Range, sufficient Kasaba labour can be produced by offering relatively higher wages.

157. The rates of the labourers in the several ranges are indicated below :—

Ootacamund South Range.—For works connected with Mukurti Wattle Plantations which are in the vicinity of the Pykara Dam Construction Works, the men are paid Rs. 2 per day, though some women labour may be available to some extent on payment of Re. 1-4-0 per day. For pyrethrum work near Ree's Corner the sanctioned rate for labour is Rs. 1–8–0 per day for other localities Re. 1–4–0 per day.

Sigur Range and Ootacamund North Range.—For all localities in the ranges a uniform rate of Rs. 1–4–0 per day is being sanctioned for male labour.

Coonoor and Mudumalai ranges.—A uniform rate of one rupee a day is in force.

158. *Labour settlements.*—Free leases of land had been granted to certain Kurumba and Irula families on the outer slopes of the Nilgiris in Coonoor Range and for Kasabas at Anaikatti in Sigur Range. Certain Kurubars are also housed near Kargudi in order to aid in departmental operations, particularly in elephant work and tuckle cultivation. The labour settlements are expected to assist the department in preventing and putting out fire and to supply labour for departmental works. A list of Labour Settlements are given in Appendix IV to this Working Plan.

CHAPTER V.

Past Systems of Management.

Section 1—General history of the forests.

159. The Nilgiris district is one of those few happy countries which had remained unaffected by the turmoils of political and historical events. Though some antiquities have been unearthed on the plateau in the shape of cairns and burrows used as burial places and some specimens of pottery they throw almost no light on the actual early history of the plateau. The Nilgiris due to its cold climate and the difficulty of the passes that led up to it and the malarial jungles that hedge it around in the lower levels should have naturally

damped the temptations of even the boldest invader. It never contained any towns worth sacking or forts worth capture. Its inhabitants were poor graziers and cultivators. Consequently, the early rulers bordering the Nilgiris almost disregarded it. Hence the materials for an account of its early people preceding the British occupation are of the scantiest. However from the neighbouring Mysore territory which has certain records of its early history some information of the Nilgiri-Wynaad region is available.

160. About 930 A.D., the Wynaad was under the control of the Ganga dynasty of Mysore. It is referred to as Bayalnad (the land of swamps), Between the close of the tenth century A.D. and the beginning of the twelfth century, the Wynaad passed on to the Kadambas who ousted the Gangas. One of the Mysore inscriptions of those days describes the Wynaad thus : " an adultress with black waving curls, an adultress with full-moon face, an adultress with endless side glances, an adultress with adorned slim figure was this storeyed mansions, the double Bayalnad " (the Wynaad had been divided into the Bira Bayalnad and the Chagi Bayalnad). The description of Wynaad in the inscription doubtless refers to the treacherous beauty of the country which attracted the stranger and then laid him low with malaria.

161. During 1104 and 1141, the Hoyasalas who were in power in the Mysore territory captured the Wynaad and the Nilgiri plateau. The first mention of Todas and Nilgiri appears in a record of 1117 A.D. relating to the conquest of the Neela mountain. In 1310 when the Hoyasalas were overthrown by the Mussalmans of Delhi, the authority over the Nilgiris descended to one Madhava Dannayaka, the son of a Hoyasala minister, who took the title of the Subedar of the Nilgiris.

162. Early in the sixteenth century, both the Wynaad and the plateau fell under the rule of the Hindu kings of Vijayanagar. An inscription of 1527 records that Masinahalli (the present Masinagudi) and its surroundings were granted to a certain person and his heirs by Krishna Raya Nayaka, the right hand of Krishna Deva Maharaja of Vijayanagar. When the Vijayanagar dynasty was overthrown by the United Muslim kings of the Deccan, this area came under one of the vassals. The Mussalman kings maintained only a semblance of power and when their hold became feeble, their vassals became independent rulers. Thus in 1610, the Raja Wodeyar of Mysore became the ruler of the Wynaad and the titular possessor of the Nilgiris. Of the doings of the Mysore kings in the Wynaad or on the Nilgiri hills, there is no information. No historical materials is available to glean anything of the history of the area from 1610 to the date of the British occupation in 1799.

163. In the treaty which followed the capture of Seringapatnam and the fatal fall of Tippu Sultan of Mysore during the final assault by the British in the year 1799, the Nilgiri plateau was ceded to the East India Company. In 1803, full rights over the Wynaad also passed on to the British.

164. The Nilgiri plateau has enjoyed a sheltered political past and due to its peculiarity of climate and topography whatever had been the change in the rulership of the territory, the effect of such changes had never been felt by the inhabitants of the plateau. Any direct influence of the early history on the forests had been mainly due to the inhabitants of the plateau and not due to the invaders. It is evident that the Todas and the Badagas have been settled at least for four centuries. A reference to them had been made in the account of a Jesuit priest who seems to have visited the plateau in 1602. The date of the appearance of the Todas in these hills belongs to a very remote past. They have always been a pastoral people and had not been known to have caused any destruction of the forests. Their immemorial custom of annual burning of grass lands for fresh pasture however have prevented the spread of the sholas around their periphery though it is not likely that sholas would have taken possession of the entire tract because certain natural factors at play in the plateau would in any case have retained a great part of the tract as grassland But in the areas now peopled mostly by Badagas it is evident that the destruction of sholas had place to some extent or other due to their early habit of shifting cultivation. The presence of secondary subseral type of vegetation in the Badaga country indicates that the sholas would have been far more numerous and extensive before the advent of the Badagas.

165. Though the Nilgiris came into the possession of the British as early as 1799, the general recognition of the salubrity of the plateau and its unlikeness to the malarial nature of the low ranges of hills came into being only after the adventurous expeditions of certain British officials from 1812 to 1820 and their experience of the new sights and lovely climate. European settlements on the Nilgiris took place between 1820 and 1830. In this connection, mention should be made of the great efforts of the then Collector of Coimbatore (John Sullivan) who in 1819 made an expedition to the hills and subsequently made the Government realize the value of the Nilgiris as a sanatorium for convalescent officers and men in the military hospitals and as the hot weather residence of the Government. By 1830, Ootacamund had become an important hill station and few years later, the settlements at

Coonoor and Wellington followed. In 1852, the Nilgiris became an independent district, because of its growing importance. Earlier, parts of it were in the Malabar district and the rest in the district of Coimbatore.

166. Even after the British occupation of the plateau, the destruction of forest growth went on and the development of the hill stations led to intense destruction of the nearby sholas for supply of small timber and firewood The insidious destruction by the Badagas also preceded side by side. It was not till 1882 when the Forest Act was introduced and the areas to be protected were selected, mapped and reserved that effective conservation of the forest were possible. The success which attended the efforts to grow bluegum eucalyptus considerably eased the fuel problem in the subsequent years and had saved the sholas being felled for fuel supplies.

167. *Regulations to prevent the destruction of the sholas.*—The continued destruction of the sholas in the Badaga country and the intensive fellings carried out in the days following the European settlements led the authorities to take measures to check the mischief. A clause was inserted in the title-deeds of lands granted to private owners compelling them to replace with saplings all banks caused by fellings. Certain better classes of trees were reserved from felling whether in public or private land. Neither rule did much good apparently. In 1837 all fellings in any shola within the limits of the settlement were stopped. About 1852 a conservancy establishment consisting of a forester and six peons was brought into being to protect the forests closed to fellings. The earnest and unceasing efforts of E. G. Thomas, the then Collector of Coimbatore, in which the Nilgiris was then included, helped to a great extent in the preservation of the beautiful sholas.

168. In 1858 Dr. Cleghorn of the Forest Service was called on to advise on the conservation of the forests of the Nilgiris as the early efforts were not very successful. He suggested that the fellings in the sholas should be limited to the minimum requirements under the control of a forester-and that active measures should be undertaken to plant quick growing trees to replace those cut down. The whole of the woods around the settlements were to be absolutely reserved and only certain sholas at a distance were to be felled in rotation to meet the current demands and planted up subsequently by the Conservancy Department. If only the series of rules and regulations made in 1860 had been enforced, they would have been ample to protect the sholas from further depradations. Protection however continued to be ineffectual during the days the forests were under the general care of the Commissioner of the district. In 1868 Commissioner Breeks wrote: " day by day I feel more satisfied that, unless conservancy is taken in hand and organized under some efficient footing under the control of an experienced officer, the destruction of the surrounding sholas is but a question time." In 1875 all the forests came under the care of the Forest Department for effective conservation. Government decided in 1880 to reserve strictly all the woods that were left in the plateau. In 1882 when the Forest Act was introduced, the selection, mapping and demarcation of the forests were carried out.

169. *The introduction of the Australian Wattles and Eucalyptus.*—The Australian Blackwood (*Acacia melonexylon*) and the Silver Wattle (*Acacia dealbata*) were first introduced in the Nilgiris about 1832 by Captain Dun. The Blue Gum (*Eucalyptus globulus*) was first introduced in 1843 by Captain Cotton of the Madras Engineers. In 1853 the systematic planting of blackwood and wattle began in the neighbourhood of Wellington. In 1856 Major Morgan who was the special officer in regard to the jungle conservancy, ordered a large consignment of bluegum seeds from Australia. Some of them were sown on a definite plan in the Tudor Hall estate and the rest distributed to the settlers. Government also sanctioned grants for the planting up of acacias. Captain Campbell of Wellington started plantations in Bandy-shola. Collector Thomas ordered the filling up of the blanks in the sholas around Ootacamund. Curator McIver planted the majority of the trees around the Lake and along the avenues. All these works were carried out between the years 1856 and 1858. Thereafter Government fuel plantations were formed at an increasing rate. Most of the fuel requirements of the growing settlements were met with from the supplies made from the plantations and hence in course of time no recourse to the sholas were made for any organized fuel felling in them. It would appear that from about 1866 when Major Morgan was in charge of the forests of the Nilgiris and the Wynaad no further fellings of sholas expressly to meet the demand for firewood were made. In 1869 Major Jago was appointed as a special officer under the Commissioner to superintend the work of conservancy and planting in the Nilgiris as Major Morgan who represented the Forest Department was in charge of Mudumalai, Sigur, Bolampatti and other forests along the ghats could not give the necessary attention to the planting work in the plateau. From the year 1869–1875 large areas were planted with bluegum in preference to the exotic acacias.

170. Inspection by Dr. Brandis, the Inspector-General of Forests was made in the year 1875. On his recommendation, Hutchins of Mysore Forest Service subsequently conducted an investigation into the rate of growth and timber production of the plantations.

Dr. Brandis recognized the danger of the Nilgiris being completely overgrown with exotic timber trees and suggested the limit of extension of the plantations to an extent of the 5,000 acres assuming the possible future demand by the extension of the railways. He also advised the planting up of the forest denuded Badaga country in order to increase the fertility of the cultivated valleys, to protect the hill sides from erosion and to conserve the water-supply and the few remaining sholas.

171. *Gamble's Working Schemes.*—Schemes for future management were drawn up by Gamble in 1882 and revised in some details in 1886. It is very unfortunate that his reports have long been lost and the unrivalled knowledge of the plantations which he possessed are not therefore available. It is however known that for bluegum coppice he adopted a rotation of 10 years. Conservator Gamble apart from giving impetus to the extension of bluegum plantations, extended his exertions to experiment with various species likely to produce timber. To him are due the existing specimens in the forest areas of species like Frenela (*Carlitris rhomboidea*), *Pinus longifolia*, *Cryptomoria japonica*, *Cupressus macrocarpa* and *torulosa*, *Casuarina qudrivalvis* and *suberosa*.

172. *Proposals to convert the plantations into high forest.*—About 1892 difficulty was experienced to sell the firewood from the plantations in view of the large supplies made from private sources. Hence Conservator Cherry suggested in 1894 that the plantations may be converted into high forest as the existing demand was fully met from private plantations. His views were examined by a committee and it was decided that wholesale conversion of the plantations into high forest was not desirable as there was no certainty regarding the future for eucalyptus timber and it may also be probable that there will be an increased demand for fuel in the future. It was decided that the existing system of felling was to be followed leaving wherever possible more standards in the coupes.

173. After the departure of Gamble no new schemes were brought into force until the introduction of Cox's plan in 1914. No more plantations were formed nor experiments made with exotics. Plantations from which fuel can be exploited with profit were worked since 1895 to 1914. Generally areas far from the market or ill-provided with communications were worked only occasionally. Subsequent history of the bluegum plantations are given in paragraphs 198 to 205.

174. *The early history of Mudumalai Forests.*—The Mudumalai forests were the property of the Tirumalapad of Nilambur and for a long time they were leased for extraction of timber. Proceedings for the acquisition of the forests from the owner were instituted in 1914 and after protracted litigation the Mudumalai forest became the absolute property of the State in 1927 when it was declared as a reserved forest. The Tirumalpad of Nilambur was given a compensation of Rs. 1,79,899–1–7.

175. The Mudumalai forests which were then a more or less an indefinite tract of 200 square miles were leased during the first half of the last century by the Tirumalpad to the timber merchant Muddannah who on a payment of a stump fee exploited the more accessible portions of the forests for many years. The first mention is the official records regarding the Mudumalai forests occurs in the letter of the Madras Railway sleeper contractor Williams, who wrote in 1855 to the Collector of Malabar stating that the fine stock of timber was being subjected to uncontrolled and unsystematic fellings of the local inhabitants. This information, which was gathered by Williams in the course of the examination of Mudumalai forests for sleeper material, was brought to the notice of the Government. In 1856 Government ordered the Collector of Malabar to report regarding the extent of the forests in question and the best method of working them. Government also wanted to know how the claims of the Tirumalpad to the forests was admitted when the whole of the Wynaad belonged rightfully to the State in succession to the Pychee Rajah after his death in 1805. In 1857 Collector Robinson gave his opinion that the Nilambur Tirumalpad's claim could not be disputed.

176. In the year 1856 Captain Campbell of the Madras Engineers took on lease for two years to work the Mudumalai forests ; when the lease expired Government rented the forests from the Tirumalpad for a period of five years in order to get supply of teak for buildings on the Nilgiri plateau.

177. In 1859 Dr. Cleghorn of the Forest Service inspected the working of the Mudumalai forests and suggested that a new Ghat Road to Ootacamund is necessary if the cartage charges of the timber has to reduce and also to expedite the transport of timber which was not possible due to the badly aligned, Sigur Ghat Road. He also found that the work in the forests were in full swing and at the time of his inspection about 12,000 teak logs were ready for transport. The sawing was done in Gundalpet workshops. Fifteen elephants and 100 bullocks were employed in exploitation of the timber and about 30 miles of interior cart road were laid out. More than 100 Kurumba axemen were in regular employ. In 1860 Government ordered a new alignment to be made in the upper part of the Sigur Ghat.

In 1862 Dr. Cleghorn visited the forests and reported that a large volume of teak had been exploited and expressed a doubt whether any would be left by the time the lease expired in March 1863. During the period of lease more than five lakhs of cubic feet of timber had been exploited though a great part of it remained uncarted to the plateau. It would appear that efforts were concentrated on the extraction of as much teak as possible and to transport them outside the limits of the forests before the lease expired. More than two lakhs of cubic feet of the timber extracted was used by the military at Wellington.

178. In August 1862 Conservator Beddome inspected the Mudumalai forests on the orders of Government in order to report on the advisability of renewing the lease in order to meet the demands of the Madras Railways, the Bangalore barracks and other works. He reported that all the exploitable teak would be very nearly felled by the time the five-year lease to the Government expired but that there was a large wealth of miscellaneous species which could be profitably extracted. These miscellaneous species were not so far felled as they were not included in the conditions of the lease. He desired that a 99-year lease should be taken by Government in order to systematically exploit the less valuable timber and also felt the prospective value of the young teak left in the forest was considerable. He also feared that if Government did not take a long lease the forests may be leased by the owner for tuckle cultivation.

179. Government agreed with Conservator Beddome and entered on a 99-year lease with the Tirumalapad with effect from 21st March 1863. An annual rental of Rs. 3,500 was fixed and Government was free to cut all trees except gallnut, sealing wax and pantham or pitch trees down to 8 inches diameter without payment of stump fee. Government had also right to clear and plant with teak or other valuable species provided a stump fee for all trees above 8 inches diameter felled from the area was paid to the lessor. All species below 8 virals (fingers) width cut in the natural forests should be at the disposal of the lessor, if required within three months of felling. No stump fees were charged for the cutting of these small trees removed in the course of improvement of the growth of the natural forests. The lessor had a right for free collection of honey, bees-wax, cardamoms, gallnuts, sealing wax and pantham. Government was free to seize or destroy elephants damaging the forest or interfering their work but they were bound to hand over the elephants to the lessor if they were alive or the tusks and ivory, if dead, after deducting the reasonable expenses incurred in the seizure or killing of them.

180. The entering into of the 99-year lease in 1863 was not followed by a reduction in the scale of teak fellings. The output was continued at the same level and it would appear that Dr. Cleghorn and Captain Beddome were misinformed by the local officers as regards the paucity of exploitable teak. Or it might be possible that their reports did not cover the more or less inaccessible areas which were probably exploited later as experience in exploitation progressed. In the year 1863–64, 52,730 cubic feet of teak logs were exploited and a large portion of them were intended for the Lawrence Asylum. In the year following exploitation was hindered by the foot-and-mouth as well as rinderpest disease which destroyed a number of the cattle of the contractors. The conservation of the teak in Mudumalai forests seems to have been ignored in the eagerness to push on the building up of the settlement in the plateau. During 1864–65 also 92,442 cubic feet of teak logs were extracted. It was only at this period it was recognized that teak fellings cannot be indefinitely prolonged without affecting future supplies and action was taken to start two small teak plantations.

181. For the twenty years covered by the period 1865–84 the Mudumalai forests were regularly exploited to their utmost capacity in order to supply timber for the various works both in the Nilgiris and the Wynaad. Nearly five lakhs cubic feet of teak timber were extracted to meet the demand during this period. Of this nearly a lakh of cubic feet of timber was sold to the public, chiefly from Mysore. Some thousands of cubic feet of timber were also supplied by Colonel Morgan to the Governmental works from the Mudumalai forests during this period. The continued heavy fellings caused the opening up of the canopy with the result the ground was covered by invasive grasses. In summer the dried up grass and the inflammable branch wood lying in the forests after exploitation caused severe fires. Damage to the logs in the forest depots by fire had been recorded but no measures were taken to prevent the occurrence of fires.

182. As compensatory plantations about 20 acres in Mudumalai and 80 acres in Benne were planted with teak, at an enormous cost of Rs. 20,373–13–1 or four annas a plant. It was anticipated that in about 50 years a mature plantation can be formed as at Nilambur. But the fallacy was not realized until 1875 when Colonel Beddome brought to light the poor growth of teak in Mudumalai forests and that it would be wrong to assume that maturity may be attained in 50 years. All further planting was therefore stopped in 1875.

183. Major Jago took charge of these forests from Colonel Morgon in 1874. Fellings continued without any regard for conservancy till 1878 when they were temporarily stopped

chiefly for want of saleable material. In 1879 the Mudumalai forest establishment which consisted of a Ranger, a forester and six forest guards was reduced to three forest guards to represent protective establishment with one Forester in general charge of Mudumalai and Sigur forests with headquarters at Masinagudi. The timber already extracted was gradually disposed of during the succeeding years and from 1879 to 1884 no departmental operations were carried out. The demands from the Public Works Department diminished and as the size of Mudumalai teak left behind was small, even attempts to persuade the Mysore timber merchants to purchase teak, or other species under permit system resulted in failure. The fact was that the Benne and Mudumalai forests were worked to full capacity and for many years they had no utility as a timber producing tract. Not only were many logs extracted during the years of British settlement in the Nilgiris but an enormous amount of wastage was made in the process of exploitation either in the forest or in the workshops.

184. Between 1876 and 1878 Benne forests were separated from the Mudumalai forests. The Madras Revenue Survey Department demarcated, surveyed and mapped the area on the 4″ scale. In the case of Benne forests the forest settlement followed in the year 1883 and completed in 1891. But due to the complaint of the Tirumalpad regarding the accuracy of the Mysore boundary, reservation of the Mudumalai area had to be delayed.

185. The year 1884 is important in the history of Mudumalai forests. Conservator Gamble visited the southern and eastern portions of the forests and made some important recommendations regarding protective measures and planned working with aim to ensure gradual improvement of the forest. Certain clauses of the existing lease was found to be objectionable and required revision. For instance, the clause permitting the lessor to collect minor forest produce led to divided control and the constant burning of the forest. The necessity to add to the conditions a provision to renew the lease on its expiry was indicated because only about 75 years of the lease remained whereas under conditions existing at Mudumalai over 100 years are needed to reach a stage of maturity for the small sized teak growth left in the area. Gamble considered that with proper protection and organized working the forest may be converted into a valuable property. A scheme was accordingly drawn up for dividing portions of the forest into annually worked compartments, for fellings by silvicultural methods, for rigid fire protection in certain areas, and for the regulation of grazing. He was of the opinion that if the period of the lease could be extended the expenditure to be incurred in improvement could to a great extent be covered by the results of the work done by the department and would lead to an enhancement of the expectation value of the forests

186. The offer of Government to increase the annual rent from Rs. 3,500 to Rs. 4,200, subject to the condition that the Tirumalpad stops the collection of bamboos in Mudumalai forests and terminates his lease of the Kumbarakolli forests on the bank of the Moyar and include them in the leased area, was not easily accepted by the Tirumalpad. Suspecting some ulterior motive connected with gold-mining or coffee planting the Tirumalpad hesitated to agree to the offer and the negotiations broke down in 1876.

187. After protracted correspondence in 1891 the Tirumalpad agree to a modification of the lease. The annual rent was raised to Rs. 4,500 and the Tirumalpad agreed (i) to include the Kumbarakolli forests (1,772 acres) in the leased area, (ii) to cancel the clauses for bidding the cutting of gallnut trees and the reserving of the right of collection of minor forest produce, (iii) to give up the right to remove trees under eight virals thick cut in thinnings and (iv) to give the option to Government of renewing the lease for a further term of 50 years subject to the payment of a renewal fee of Rs. 4,500.

188. While the negotiations were in progress the Mudumalai forests were declared as reserved land under section 26 of the Forest Act in 1889 and the Kumbarakolli forests subsequently in the year 1892.

189. After two inspections in 1886 Conservator Gamble elaborated his proposals for the departmental working outlined in 1884. He divided the Mudumalai and Benne forests into annual compartments of about 1,000 acres each. Each compartment will be worked for removal of sound trees of over six feet girth. Trees between three and six feet girth unlikely to produce good timber or interfering with the growth of better species were also to be cut. Seedlings and saplings of teak, vengai, and rosewood were to be protected from the overgrowth of inferior species. As each compartment was felled over rigid fire protection was to follow. The scheme unfortunately broke down for want of men, money and market and during the first eight years of working only 417 acres were actually worked.

190. However for a short time under the advice of Conservator Plet, about 40,000 cubic feet of timber was extracted from the Benne forests under the system of ' Jardinage." Since the price of timber fell considerably, even this scheme had to be given up. As regards fire protection also nothing effective was achieved. The chief causes of the fires were the want of protection along the Mysore boundary, the absence of fire-traced camping ground

along the roads and the activities of Jain Kurubars and Chettis. Some effort was made to win over the Jain Kurubars by the free grant of cloth. The Mysore boundary was also at times fire-traced.

191. In 1892, Conservator Cherry visited Mudumalai and Benne rest-houses which had been just rebuilt. He found the range establishment incapacitated with fever and also noted that no work of importance was being carried on except for occasional logs dragged from Benne side, by means of a single elephant. The scattered and spasmodic attempts at fire protection were failures. The improvement fellings suggested by Gamble came more or less to a standstill.

192. The Board of Revenue drew the attention of the Collector and the Conservator to the fact that the Nilgiris division was very far from paying its expenses and wanted suggestions to augment the revenue. It also desired Conservator Popert of the Central Circle to inspect the Mudumalai and Benne forests and to report on the enhancement of the revenue from them, in the light of his great experience of the Burma teak forests, as the Board felt that report of Conservator Cherry of the Southern Circle to be meagre. Popert reported that a large revenue from the depleted forests were out of question and that the number of saleable timber could be counted on one's finger ends. He suggested the introduction of the Burma Taungya System into the Benne forests as a means of restocking the forests as there was a paucity of teak due to excessive exploitation in the past, or as Popert put it 'the plums have been most effectually picked out of the cake.' Accordingly in the year 1896 Taungya was started and the clearings planted with teak, rosewood and vengai. But most of the seedlings died. Between 1896 and 1900 a fillip was given to improvement fellings but it always involved in a loss, as the thinned out material did not fetch handsome returns. Fire protection was also confined to the small areas under improvement fellings and the small teak plantations. The chronic ill-health of the establishment, the scarcity of labour, want of a definite allotment of funds to be spent on the conservancy of the forests without any reference to the resulting revenue and the preoccupation of the District Forest Officer Douglas with the selection demarcation and settlement of the numerous isolated reserves with many complicated claims during the period 1888 to 1898 stood in the way of giving effect to Gamble's recommendations and Popert's suggestions. However in the year 1897 the boundary dispute concerning the Mudumalai-Mysore boundary was finally settled and demarcated with six large stones marked A to F.

193. In 1897, Arbuthnot was placed on special duty to draw up a working plan for Mudumalai and Benne forests. He valued the stock in Benne reserve and made rough notes for his plan. He estimated that there were only 1,800 teak trees with saleable timber on the whole area of 11,191 acres; he also estimated that about 20,000 mathi trees were ripe for felling and conversion into railway sleepers and that there were between 3,000 and 4,000 rosewood, vengai and venteak trees. He also observed that teak is no longer the dominant species in Benne forests and that mathi (*Terminalia tomentosa*) had taken its place. Arbuthnot's work began and ended with the valuation of Benne reserve. The working plan that was envisaged was not prepared but his suggestion to work the mathi trees for sleepers was given effect to and the forests were opened to sleeper fellings between 1898 and 1902.

194. Work in the Benne forests commenced with an idea to supply 7,500 B.G. mathi sleepers at the Calicut railway depot for the extension to Cannanore. While sawing contractors were being collected, the local Kurubars were employed during the monsoon of 1900 and about 1,700 trees were felled. The plan was to saw the timber in the forest, to cart the sleepers to the right bank of Karumpaya, thence by river or cart to Membat, to be finally floated down the Nilambur River to Calicut. The sawing contractors found the timber to be full of flaws and the rates offered insufficient to keep the labour contended. By August 1901 only 166 sleepers were made ready by the 56 gangs. For want of elephants to drag the timber to a sawing depot the sawyers had to work exposed to rain and wind with the result many fell ill, got frightened and ran away. With effort they were gathered and work started again. But towards the end of October smallpox, dysentery and malaria broke out severely and many died. By June 1901 about 6,000 sleepers were produced in spite of all the troubles and tribulations but the whole undertaking left an evil reputation and the Benne forests will remain a dreaded place for years to come. It is found that the wastages of timber felled but not converted amounted to nearly 70 per cent. The sale of sleepers brought in a revenue of Rs. 20,153 against an expenditure of Rs. 19,757.

195. Between the years 1903 and 1905 anticipating the demand of the mines at Kolar, fellings of *Anogeissus latifolia* in Mudumalai forests were commenced by District Forest Officer Jackson. Under instructions from Conservator Gass the Anogeissus timber extracted in Mudumalai was despatched to the depot at Nanjangode so that when there is a demand for the timber the sale may be conducted by the North Malabar Division District Forest

Officer (Lushington). Sixteen thousand four hundred and fifty-seven cubic feet of Anogeissus timber were extracted in Mudumalai forests, of which 14,218 cubic feet were sold for Rs. 8,917 at Nanjangode. The greater part of it was sold to the Ordnance Department and not the Mines as they appear to have got their requirements elsewhere. Most of the balance stock were written off as unsaleable.

196. Between 1906 and 1908 the north-western corner of Block I was worked according to a plan drawn up by Jackson. Teak, rosewood, vengai, venteak and jal were extracted to an extent of 32,253 cubic feet. Of this 10,525 cubic feet were sold in December 1906 for Rs. 4,345. In February 1908 for Rs. 751, venteak to an extent of 1,201 cubic feet were sold. In April 1909 a sum of Rs. 568 was realized by the sale of 1,078 cubic feet of venteak. The balance of 18,925 cubic feet remained unsold till 1901 when a forest cart-track was constructed through the Wynaad forests by Foulkes from Maragaddi depot to join the main road. The timber dragged to Maragaddi depot (about 12,000 cubic feet) was sold for Rs. 14,393. Further history of the management of the forests of Mudumalai Range is mentioned in paragraphs 211 to 223.

Section 2—Past system of management and their results.

197. The Nilgiris division produces timber, firewood, sandalwood, bamboos, minor forest produce, wattle bark, pyrethrum flowers and provides for the grazing facilities for cattle. The past history of management is given in the following paragraphs under each of these items.

198. *Exploitation of firewood.*—The blue gum plantations have been the main source of firewood in the plateau. The first scheme for systematic management began in 1882 in accordance with the plan drawn up by Gamble. Gamble in his plan of 1882 which was revised in some details in 1886 fixed a rotation of ten years for blue gum coppice. Though it was intended by him that the rotation should be reconsidered at the end of ten years, the same rotation was continued till Cox's Working Plan came into force in 1914.

199. According to Cox's plan the blue gum plantations were worked on a rotation of 15 years. The more accessible of the blue gum and Acacia areas were worked under simple coppice system, the remote areas having been considered only when there was a demand. In 1922 and 1923 the coupes were sold standing to contractors but as it was found that the revenue realized was not satisfactory, departmental felling was reintroduced in 1924. In 1925–26 the retailing of the outturn departmentally was abandoned and the fuel which was cut and stacked departmentally was sold to wholesale dealers. Cox's plan also provided for the retention of the plantations which could not be worked with profit as high forest and for the manufacture of charcoal from the thinnings in the high forest areas.

200. Dyson's Working Plan was introduced in the year 1928 when Cox's plan ceased to be in force. Dyson changed the blue gum coppice rotation from 15 to 20 years. Working was extended to the more remote areas and provision was made for the conversion of all Acacia and Calitris areas in the Coppice Working Circle into blue gum plantations at an espacement of 9 feet by 9 feet. The total area of plantations brought under Dyson's plan was 1,250 acres with seven felling series. Restocking of large blanks in the bluegum coppice areas, working of the high forest areas under the system of coppice with standards on a rotation of 26 years for the coppice and retaining twenty trees as standards, and working of Rallia plantations on a rotation of 30 years for production of charcoal were some of the important aspects of Dyson's plan. In 1931–32 a road to Rallia taking off from the Wellington-Kotagiri road was constructed and consequently the departmental charcoal operations prescribed in Dyson's plan were stopped and the plantations began to be worked for fuel by selling the coupes standing to the contractors.

201. Work in Teppakuchi plantations deviated considerably from the prescriptions of Dyson's plan. Compartments 3 to 18 were sold standing to a contractor on a four-year lease, instead of working it over the longer period prescribed in the plan, as a special case on the consideration the contractor constructed a road in the place of the bridlepath leading to the plantations. Due to delay in obtaining permission from the District Board, the road could not be constructed in time and consequently there was delay in the working of the plantations necessitating extension over a period of three years. It is this history that accounts for the uneven distribution of age gradations in the Teppakuchi Blue Gum Series.

202. Deva Shola Plantation which was included in the coppice with Standards Working Circle of Dyson's plan and not prescribed for working during the period of his plan was sold standing to a contractor who was forthcoming to work the area under simple coppice. Indications, that some of the plantations which were considered in the past as remote and hence unprofitable for working were gradually coming within the enterprise of the contractors due to greater demand of fuel, are available during the period of Dyson's plan.

203. After Dyson's plan (1928–38) C. R. Ranganathan's plan came into force in 1938. Though it ceased to be in force in 1948 the work was carried on within the general framework of the plan as there was delay in taking up of the revision of the working plan due to the repurcussions of World War II. In Ranganathan's plan the bluegum plantations were to be coppiced on a rotation of 18 years and where at the end of three rotations the output of a plantation fell short of 85 per cent of the yield obtainable according to the local yield-table, it was to be replanted with mossed blue gum seedlings. The area of the Coppice Working Circle was 1,476 acres and there was no coppice with Standards Working Circle in the plan. Blue Gum standard trees that were found in the old plantations were to be worked for timber whenever demand arose. There were nine felling series in the Coppice Working Circle. Provision to fell the silver wattle undergrowth in the plantations on a rotation of six years was made in order to supply faggot fuel for the poor classes. This never worked in practice as no offer was usually forthcoming in the early days of the plan and the very poor rarely wanted to pay for any fuel. Further during the later years it was considered that as the wattle undergrowth serves a valuable purpose in the protection of the soil, it would be undesirable to frequently cut the undergrowth and hence the subsidiary Acacia fellings were given up. Further though the felling of the annual compartments were to be done departmentally according to the plan, the practice from the very beginning had been to sell the coupes standing.

204. The prescriptions of Ranganathan's plan were generally followed from 1938 to 1945. Thereafter larger areas had to be worked to meet the increased demands for fuel during World War II and the period immediately thereafter. The rotation was reduced to as low as 12 years and a scheme of fellings were drawn up, though in actual working only plantations 13 years and over were exploited. After 1942–43 the practice of selling the coupes in public auction was given up, and coupes were allotted to chosen contractors at a fixed price on the understanding that they should supply the market steadily at the rate fixed by the department and approved by the Collector in his capacity as Civil Supplies Officer. This measure during the war years was found necessary to arrest the soaring price of fuel on the hills. Control over movement and price of firewood was removed in 1948. With the decontrol the situation again began to be bad. Though the demands from the Military ceased to be enormous, the civilian demands were on the increase due to the general increase in the population and depletion of private sources both by rapid exploitation and conversion of small private plantations into potato fields. So the annual coupes were divided into two classes, one set being sold on condition that the fuel from them should be supplied to the relief shops at Ootacamund and Coonoor at specified rates so that the poor may obtain in retail from such shops firewood at a fixed rate, and the other set was sold without such conditions so that the contractors may dispose of the stock in the free market, within the municipal limits of Coonoor and Ootacamund. The system of relief shops ceased in the year 1952.

205. During the period of Ranganathan's plan blue gum timber was tested for the use as sleepers in the Forest Research Institute at Dehra Dun. The results indicated that the blue gum sleepers split badly. From the seasoning point of view the timber requires protection from sun and hot winds to prevent cracking and hence unsuitable for any outside locations. Treatment with preservatives also showed that penetration was confined only to sapwood and that the end penetration was also extremely poor in the heartwood. Planting of wattles in quincunx with blue gum was also tried and given up as the wattles compete with the blue gum to the detriment of both. In the case of planting blue gum in clearfelled areas the prescribed espacement of 9′×9′ was departed from 1949 and planting was done at 12′×12′ to avoid congestion in the coppice crop in the later rotations and for better development of the blue gum stems. As regards the sale of coupes from 1948 onwards they were sold twice in a year in two sets with a lease period of six months in order to get uniform supplies throughout the year instead of selling all the coupes allotted for the year at the same time with a lease period of one year.

206. *Hardwood Eucalyptus plantations.*—In 1905 it was suggested by Sir Francis Spring that the well known hardwood Eucalyptus trees of Australia may be tried in the Nilgiris with a view to produce timber for railway sleepers. Though as a matter of botanical interest many species of Eucalyptus were raised in the Nilgiris from the early years of the British settlement, no organized effort at a regular plantation was made till 1910. From 1910 to 1912 a total area of 121 acres was planted with the hardwood species in Ketti, Aramby VI and Snowdon I. The species planted were *Eucalyptus pilularis, E. punctata, E. eugenioides, E. paniculata, E. propinqua, E. acemenoides, E. hemiphloia* and *E. crebra*. Cox's plan which came into force in 1914 did not provide for the extension of the hardwood plantations. In 1920 Conservator Fischer decided that *E. pilularis, E. paniculata* and *E. eugenioides* which gave relatively better indications should be planted on a regular working scale. With the concurrence of Chief Conservator Cox the gradual planting up of either grassland, or scrub in the plateau with the hardwood Eucalyptus species commenced in 1922. Under Tireman's orders the planting up of grasslands with the hardwood species was given up as it yielded

poor results and it was decided to plant up in the clearfelled Acacia areas. Accordingly from 1924 to 1928 many Acacia areas after clearfelling were converted into hardwood Eucalyptus plantations.

207. Dyson's plan (1928–38) constituted a Hardwoods Eucalyptus Working Circle and prescribed the planting up of many felled Acacia areas with *E. pilularis*, *E. punctata* and *E. eugenioides* which were found to be the best of the species. An annual programme of planting and periodical thinnings in the older areas were prescribed. The areas that were planted with the hardwoods from 1924 to 1927 cover 290 acres and the areas planted during Dyson's plan cover 77 acres.

208. Thus when Ranganathan's plan came into force in 1938, 367 acres were under the different hardwood Eucalyptus species. No plantation was found to grow with the rate of development known in its home and the timber from E. *eugenioides*, which was considered to have fared fairly well, when tested gave no indications for a first-class timber for use as sleepers, the object with which they were grown. It was considered unwise to add to the extent of the hardwood plantations before the species already planted gave any definite indications and also because it was felt that more than sufficient area was planted to satisfy all experimental requirements. Hence the plan did not include any provision for the planting up of the hardwood Eucalyptus over new areas. Only regular thinnings in the previously raised plantations were prescribed. The thinnings were to add to the supplies of fuel incidentally.

209. None of the species planted showed any promise for the production of satisfactory timber. Further during the later years even the thinnings were not properly carried out both because of the War which concentrated work in supplies from blue gum areas and because of the opinion that the hardwood plantations have to be converted into blue gum before they become too big to be worked for firewood. Towards the end of the working plan period and the years following some of the hardwood eucalyptus plantations were converted into blue gum.

210. *Fuel working in Sigur Range.*—In order to supply the legitimate demands of the people in and around Masinagudi and to minimize the illicit fellings in the adjacent reserves a small coupe of about two acres was worked more or less regularly from 1930. The coupes were in Moyar Reserve near Masinagudi and the main attraction in the fuel coupes is the teak content, though it is inferior teak. Some artificial regeneration was also attempted but it came to nothing. Even the selling of the small annual coupe was discontinued from 1944–45 for want of demand. But due to the taking up of the Moyar Hydro-electric Project two coupes one near Moyar Camp and one near Masinagudi were sold from 1949 to meet the demands of the floating population.

211. *Exploitation of timber from Mudumalai Forests.*—The first attempt at systematic working of Mudumalai forests was that made by Gamble in 1884–86 (vide paragraph 189). Shortly afterwards according to Popert's proposals, though felling was confined to the sound trees of and over 5 feet girth and of crooked, hollow and unsound trees above 3 feet in girth as prescribed by Gample, the elaborate thinnings included in Gamble's scheme were abandoned. Though the area covered under Popert's scheme was not materially different from the slow progress of Gamble's scheme the financial results were somewhat better. Between 1899 and 1902 the Benne forests were largely felled for mathi sleepers (vide paragraph 194).

212. In 1907 Jackson's plan attempted to localize the random fellings that were taking place by dividing the forests into four forest blocks. Though fire protection of the worked compartments was prescribed, no special measures for the tending of the young growing stock were made. Due to the fact the forest was a leased one, it appears that the main aim had been towards exploitation for more revenue than for any organized conservancy.

213. Cox's plan for the entire Mudumalai Range came into force in 1910. It mainly concerned with measures of slow rehabilitation of the overworked forests than for exploitation for revenue. Cox considered that the past history of Mudumalai forests was a record of improvidence and that that time had come when no further revenue fellings should be made unless it be for silvicultural reasons for the improvement of the growing stock. Since Mudumalai timber was no longer required in large quantities for the development of the settlements as in the early days, and as the quantity of Mudumalai timber had fallen down due to the exploitation of all good timber, there was no good market for it. Hence circumstances were propitious for Cox to introduce a change in the policy of the management of Mudumalai forests. The piece deresistance of Cox's plan was the provision for extensive fire protection and improvement fellings consisting in the removal of all inferior species interfering with sound teak, cutting of all dying, dead, unsound and rotten teak flush with the ground in order to produce good coppice. In practice all marketable timber that could be obtained by the improvement fellings were extracted and the important work of tending the young

growth or cutting back of malformed stems was always left in arrears. Although the professed object of the plan was to undertake no fellings that were not dictated by silvicultural necessity, in practice, a good amount of timber was extracted, the average annual outturn being about 40,000 c.ft. Cox provided for the permanent demarcation of the block lines and gave local names to each block. The work prescribed in Cox's plan was carried out till 1919. In 1916 Richmond observed that the hope of the coppice regeneration restocking the forest was largely belived by the results. While there was a general improvement in the forests, both the possibility of the young coppice of establishing itself or natural regeneration from seed springing up on the forest floor never materialized. Dissatisfied with the slow rate at which the existing silvicultural methods were helping to restock the forest with teak, Richmond attempted certain experiments between 1916 and 1918 to bring about natural regeneration by clearfelling all growth except teak and burning the area to induce the seeds to germinate in the open as the teak failed to germinate in the shade of the forest floor. The trials at natural regeneration failed but experiments at artificial regeneration done in 1918 proved to be successful.

214. *Tuckle (Thakkal) cultivation with teak.*—Following the suggestion of Conservator Popert made in the year 1895 a start in the artificial regeneration by the Burman " taungya " method (locally called " tuckle " method) was made in 1896 in Benne Block. This consisted in the planting up of teak in clearfelled areas in combination with the cultivation of dry field crops. But the efforts were not attended with success. With the advent of Jackson's plan of 1907 tuckle cultivation of teak through the agency of the local Kurumbas was tried from 1907 to 1911 over an area of 32 acres but only 10 acres tried in 1907 appear to have had some success. Cox's plan of 1910 did not provide for any extension of tuckle cultivation of teak as it was found that large areas had been laid waste in the name of tuckle and the department had to do subsequent planting at an enormous expense in areas which the Kurumbars failed to cultivate for one reason or other. Only such of the areas already leased out were to be brought under tuckle during Cox's plan and not any new areas. In about 150 acres which were attempted between 1909 and 1912, even as early 1915 only an effective area of 18½ acres was found to be successful. The tuckle plantations did not appear to have had the tending they deserved in the years that followed the planting. In 1917 tuckle with teak was attempted once again over an area of 13 acres, and the area had to be planted again in 1918. The tuckle method of raising teak plantations in Benne Block proved to be a definite and expensive failure. The method was dropped and was not revived till 1925 and thereafter annual plantations were raised successfully in Mudumalai and Teppakadu areas regularly by this method except during the years 1945 to 1947.

215. In 1918 Inspector-General of Forests G. S. Hart visited Mudumalai and Benne forests and suggested that the taungya plantations of teak should be perserved with till success was achieved. As regards the working of the forests for timber and their improvement, he stressed the necessity of cutting back the malformed and unsound teak so that useful material may be obtained from them in future.

216. In 1919 Conservator Tireman introduced certain innovations in the management of Mudumalai forests. He ordered apart from the improvement fellings that were being carried out, the conduct of secondary tending operations for the benefit of the seedling and coppice growth resulting from fellings, in all the compartments previously worked. He also suggested experiments in gap regeneration and in stump planting, which were tried in 1921. Under his orders 25 acres in the vicinity of Kargudi Rest House was dibbled with sandal seeds in 1920. The result of the experiment caused the extension of dibbling over 120 acres by 1924. Though early success had been recorded, very unfortunately only very few trees are at present available. Most probably the lack of proper hosts and damage by fire might be the cause for the total failure. Tireman also ordered eradication of Lantana near Benne and Mudumalai and the introduction of *Erythrina lithosperma* and *Artocarpus hirsuta* in Benne tuckle areas, but the efforts were unsuccessful. In 1921 his attempts to raise teak by clearfelling coupled with a certain amount of sowing also turned out to be failures. And the experiments were repeated in the years 1924 to 1926 and among them the raising of teak tuckle method with ragi crop gave satisfactory results. Tireman therefore suggested that the existing method of improvement fellings having done no appreciable good to the forests, the best method of treating them was clearfelling and artificially regenerating them. Tireman's ambitious schemes regarding the clearfelling and regeneration of large blocks of area were examined by Chief Conservator Cox, who observed that wherever soil conditions were suitable it may be advisable to resort to concentrated artificial regeneration but not over large areas because he was of the opinion that fire protection and other measures of conservancy attempted in the past had not as yet converted most of the areas in the locality into areas of sufficient soil fertility to attempt on a large scale artificial regeneration after clearfelling. Hence till 1921 the improvement fellings were carried on over most of the areas and concentration of artificial regeneration

was confined to few selected areas. The artificial regeneration of teak was done by resorting to tuckle method in selected localities in Teppakadu and Mudumalai blocks and the efforts were successful.

217. In 1927 Hick's plan for Mudumalai forests was introduced. So far as timber production is concerned it constituted a Clearfelling Working Circle and a Selection-Improvement Working Circle. Though Hicks allotted an area of 6,658 acres to the Clear-felling Working Circle, for artificial regeneration with teak on a 100-year rotation, Chief Conservator Richmond disagreed that such a large area was suitable for artificial regeneration with teak and ordered that on detailed inspection an area of 300 acres must be selected for the period of the plan. Accordingly the site was selected in compartments 4 and 6. In the Selection Working Circle it was prescribed that all trees above 6 feet girth at breast height which are capable of being marked silviculturally for removal are to be extracted. As an improvement to the growing stock it was prescribed that very unsound, very mis-shapen or obviously moribund teak trees or poles were to be removed and that all inferior species interfering with teak should also be removed. Cutting back of unsound or badly shaped teak saplings not thicker than a man's arm was also prescribed. Under Hick's plan during the years 1927 to 1936 an area of 257 acres were artificially regenerated in Chinakolli and Nellikare localities 241 acres were with teak and the rest with miscellaneous species like mathi and vengai, that latter being put in such portions of the clearfelled areas where teak would not come up well. Though the growth of teak is admittedly poor when compared with other teak plantations elsewhere outside Mudumalai forests, yet it cannot be denied that the potential economic value of these plantations is much higher than that of the mixed forests thay have replaced.

218. During the period of Hick's plan considerable experience had been gained in the raising of teak by the tuckle method. This method which was found in practice to be a definite failure in Benne block in the early days mainly due to want of attention in the tending stages and inexperience in the technique, had been converted by continued perseverance to be the only method of raising teak in Mudumalai and Teppakadu blocks. In 1927 and 1928 attempts to raise a second crop of ragi in the tuckle area was made and ended in poor results. The weeds that are allowed to come up with the first crop set seeds and dispersed all over the field before the ragi was sown as a second crop in the succeeding year. The seeds of the weeds germinate early and being native to the soil establish them-selves well and smother the newly sown ragi. The question of raising a second crop of ragi was examined in 1929 by the Millet Specialist at the Agricultural College, Coimbatore, and he gave his opinion to the effect that under the conditions prevailing at Mudumalai it was not possible to get a good second crop of ragi in the teak tuckle areas. From 1933 onwards stumps were exclusively used for the areas to be regenerated with teak. In 1932 hill paddy was tried in the tuckle area with disappointing results. During the period of Hick's plan considerable difficulty in the matter of selling the extracted timber was experienced as the inferior quality timber had to complete with better quality timber produced from the adjoining tracts and also because certain general economic factors causing a depression in trade affected the timber market also. In the years 1931 to 1933 the position became so acute that fellings were suspended. As it was found that during the improvement fellings considerable number of inferior species were either girdled or felled with no certainty of the desired coppice or seedling growth taking its place but usually leading to the invasion of grasses in the places where canopy had been opened, an amendment to Hick's prescriptions was made in 1932 by Richmond. The amendment laid stress on the closing of the canopy as the dominant object and subordinated all fellings to this prime consideration.

219. The following statement shows the areas and results of fellings made under the Selection-Improvement fellings during the period of Hick's plan :—

Year.	Compartment number.	Area in acres.	Yield in cubic feet.		
			Teak.	Other species.	Total.
1927–28	16	1,227	45,052	28,661	73,713
1928–29	15	1,568	17,850	17,850	35,680
1929–30	17	905	12,497	11,127	23,624
1930–31	27	1,106	34,226	18,803	53,029
1931–32 } 1932–33 }	No fellings due to depression in the timber market.				
1933–34	18 part.	150	4,606	2,329	6,935
1934–35	18 part.	739	7,053	7,429	14,482
1935–36	18 part. } 19 part. }	50 } 899 }	37,963	17,484	55,447

220. The total quantity of timber removed from Mudumalai forests since they came under the management of Government in 1857 is shown in the following statement :—

	C. FT.
1857 to 1910	1,171,347
1910 to 1926	622,551
1926 to 1936	286,367
Total ..	2,080,265

Not counting the wastage in extraction which was enormous, these forests have produced in about 80 years more than 20 lakhs of cubic feet of timber, the greater part of which was teak. The total area worked over amounts to about 50,000 acres giving on an average about 25,000 cubic feet every year.

221. C. R. Ranganathan's plan (1938–48) included a Selection Working Circle and a Teak Plantation Working Circle as far as production of timber was concerned. The Selection Working Circle embraced 24 compartments, namely, Teppakadu 1 to 5, 11 and 14, Mudumalai 15 to 21, 23 to 27 ; Benne 29, 30, 37, 38 and 39. Compartments 22, 31 and 36 included in Hick's plan were excluded as they were relatively poor in teak, whereas compartments 1 and 11 omitted in that plan were included in Ranganathan's plan for their richness in teak. All compartments, except Teppakadu 14 which lies east of Moyar in Sigur Range, are in Mudumalai Range. The Selection Working Circle covered an area of 28,829 acres and included adequate stock of teak, mathi, vengai, rosewood and venteak which are usually exploited for merchantable timber. The prescription included the working of one compartment every year on a felling cycle of 24 years. Marking of selection trees were confined to those of and above six feet girth at breast height. There was no obligation however that all trees of the exploitable size should be felled, the marking for felling being done on silvicultural grounds. Subsidiary fellings which aimed at freeing the younger classes from suppression and the cutting back of badly shaped and moribund teak saplings were prescribed. The prescriptions of the plan were generally followed but the work was always behind schedule as the dragging of the converted timber lagged behind the felling operations, mainly due to lack of sufficient elephant power. This had resulted in some corners of the compartments not being completely worked or some materials remaining undragged for some time. Further everything went out of gear during the war years because in Mudumalai Range selection felling and other operations were suspended from 1943–44 to 1946–47 as the Military occupied the area for training. The work was resumed in 1947–48 and has been continued since. All the timber extracted from the area were sold locally till 1948. From 1949 the better varieties of timber were transported to Nanjangode for sale along with Wynaad timber and only the inferior quality timber and poles were disposed of locally. At present only rosewood timber is rough-squared before transport to the depots, all the rest being exploited in the round form only.

222. The Teak Plantation Working Circle of Ranganathan's plan included 201 acres for conversion of the deciduous forest into plantations in the period 1938–48. The areas were in four patches occurring in compartments 2, 18 and 19. The area of teak plantations already existing at the time of the inception of Ranganathan's plan was 586 acres. The plan prescribed the planting up of teak stumps at an espacement 6 feet × 6 feet by the tuckle method through the agency of the local Kurumbars. Provision for the tending of the young regeneration areas and the thinnings of the older plantations was made. Thinnings were sadly neglected. Planting was done regularly except for the year 1945 to 1947 due to the suspension of forest operations in Mudumalai Range on account of its occupation by the military for training. In the years following the period of the plan, work was done generally within the framework of the plan but in 1948 and 1949 planting was done at an espacement of $8\frac{1}{2}$ feet × $8\frac{1}{2}$ feet on the belief that better diameter increment may be attained. However this only resulted in heavy invasion of Lantana growth and other weeds with the result that in 1950 planting was restored to 6 feet × 6 feet espacement. The area planted under teak during 1938 to 1948 was 288 acres ; from 1949 to 1952 about 120 acres had been planted. The yield obtained during the last plan in the different compartments of the Selection Working Circle and in the clearfelled areas for raising Teak Plantations are given in paragraph 280.

223. *Elephant capturing operations.*—Ever since 1910 elephant capturing operations were conducted in Mudumalai Range and the sale of captures gives the division one of the important source of revenue. During some years no operations were undertaken for want of trained elephants. The pits for the capture of elephants are usually dug on the migratory tracts which cross the Moyar above the falls.

224. *Management of sandal tracts.*—The sandal tract in the division are confined to Coonoor and Sigur Ranges. Prior to 1926 the sandal areas of Coonoor Range had never been worked, except for miscellaneous extraction from lands assigned on patta. As regards

Sigur Range the information regarding the extraction of sandal in the early days is very scanty. In the last two decades of the last century, extraction of sandal trees including living ones had gone on an average of about 38 tons a year. From 1901 to 1907, extraction was confined to dead trees and yield was fixed at $6\frac{1}{4}$ tons per year. From 1907 according to Jackson's Plan, dead sandal was extracted in Sigur Range on a scheme which divided the area into ten coupes. About 1922 it was decided to extract all dead sandal as well as living sandal of and above 24 inches in girth from reserves and unreserves. Between the years 1916 to 1921 extraction was generally confined to the unreserves around Masinagudi. By 1923 all exploitable trees in Sigur and Kalahatti slopes reserves were extracted. According to Ardagh's Scheme sandal seeds were dibbled in a selected area in Avarahalla reserve over 20 acres in 1921, which proved to be successful. A revised scheme of his provided for the extraction all sandal over 12 inches in girth in view of the difficulties of protection. By the end of 1926 all sandal down to that girth had been extracted except for about 700 trees in the Bokkapuram unreserves. Between the years 1915 and 1926 in Sigur Range about 108 tons of heartwood and 24 tons of chips and dust were extracted.

225. In 1926, Dyson's Scheme for the extraction of sandal wood in Coonoor and Sigur ranges came into force. It dealt with only the reserves of the two Ranges as it was felt that there would be no trees worth exploiting for many years in the unreserves due to the exploitation of the living trees in those tracts during the previous years. A felling cycle of six years was adopted for each range. All trees over 36 inches in girth as well as dead and severally stag-headed trees were to be extracted. Artificial regeneration of sandal over an area of 25 acres every year by dibbling seeds at stakes spaced 20 feet × 20 feet was provided for in selected localities. Dyson's Scheme was upset soon after its introduction by the appearance of spike in the locality. Spike was first noticed in this division on 10th January 1928 near the twelfth mile on the Sigur Ghat Road. It spread readily to the north-east to Anaikalmarigudi and westwards towards Westbury estate. In January 1929 there was a second outbreak of spike in an epidemic form and more than 3,000 sandal trees in Bokkapuram reserve died. Dyson's Scheme was therefore abandoned and the trees dead due to spike were extracted. The attempts at the artificial regeneration ended in complete failures. In 1932 Bridge's Scheme, to extract only dead sandal in Coonoor and Sigur ranges including Sigur unreserves on a three-year cycle and to form five annual propogation centres of sandal was brought into being.

226. *Artificial regeneration of sandal in Mudumalai and Coonoor Ranges.*—About 125 acres in compartment 1 of Teppakadu block were dibbled with sandal from 1920 to 1924 and in the early stages the results were successful so that Hick's working plan of 1927 provided for the annual regeneration of 25 acres on similar lines. But the early success of the dibbled sandal ended in complete failure as the years rolled on. The failure of the sandal to establish itself led to the cancellation of Hick's prescription in 1928 and instead ten one-acre propagation centres every year were taken up. No satisfactory results were obtained even by this method. In 1929 formation of sandal plantations by the tuckle method was started. The area in compartment 7 near Teppakadu which was then under cultivation by the local Kurubars was taken up and sandal was raised with dhall at each stake as a temporary host, when the second field crop of ragi was raised over those 24 acres. The plantation proved to be a magnificent success. Jatropha cuttings were planted in 1932 when the hosts were scanty. Bamboo rhizomes were planted in 1936 in the area for the same purpose. Similar experiments were tried subsequently in other areas but with no success. An area of 10 acres near Kekkan Halla was tried with sandal by the tuckle method and the sandal that came up was unfortunately burnt out by a fire in 1934. In 1933 a plot of 30 acres was tried with sandal by the tuckle method and the plantation held promote of success in 1934 but subsequently faded out mainly due to browsing by deer. Similarly in 1933 in Konakarai Slopes reserve of Coonoor Range two plots of five acres were regenerated with sandal by the tuckle method with the help of Irulas. As further tuckle plantations of sandal were prohibited by the Chief Conservator in 1934, sandal was raised in 1935 in the area by a modified method. Two half-acre plots were chosen and were cleared of all growth except the big trees, the slash burnt and the sandal was dibbled in two rows 30 feet apart with an intermediate row of Erythrina cuttings. The sandal patches were in 6 feet diameter circles with dhall sown as a temporary host. The Irulas of the Konakarai settlements did all the work in return for the dhall which they were permitted to harvest subsequently. There was some early success in the work undertaken.

227. C. R. Ranganathan's plan (1938–48) for the Sandal Working Circle included all sandal areas in the reserves and the unreserves of Coonoor and Sigur ranges. The sandal was extracted on a felling cycle of three years in each range and the exploitation was confined to the uprootal of dead trees above three inches in girth. An approximate annual yield of 30 tons from Sigur Range and one ton from Coonoor Range was expected. The extracted trees were rough-cleaned and transported to Satyamangalam depot of

Coimbatore North Division for final cleaning and sale. Provision was made to raise sandal artificially by means of propagation centres and by the tuckle and the strip methods. Propagation centres do not appear to have been made systematically because of the undesirability to spend money in an area prone to be attacked by spike and due to the failure of the attempts made in 1938–39 in compartments 9 and 10 of Mudumalai Range. No other attempts at sandal regeneration were made since then. Spike is still prevalent. The extent of sandal in Sigur Range is threatened both by the endemic nature of the spike and the periodical fires. The stock of sandal in Burliyar and Rangaswami Peak reserves have been recorded to be increasing in spite of the prevalence of spike. The quantity of sandalwood extracted during the recent past is given in paragraph 280.

228. *Management of bamboo forests.*—There had been no organized working of bamboos either in Mudumalai or Sigur Range. Whenever there was demand removal had taken place by issue of permits. In Coonoor Range a similar system was in vogue till 1920. From 1920–21 the bamboos in Haduthorai reserves were worked on a five-year cycle. From 1922–23 the bamboo area in Vagappanai reserve was worked on a four-year cycle. From 1926–27 according to a scheme prepared by Ranger Kandan all the bamboo areas in Vagappanai, Haduthorai, Kallur and Burliyar reserves were worked on a five-year felling cycle, the whole area being divided into three felling series. Ranganathan's plan (1938–48) included all the bamboo areas of Coonoor Range. The bamboos of the reserves of Vagappanai and part of Konakarai Slopes came under Vagappanai Series and the bamboos of Hulikal and Burliyar reserves came under Hulikal Series. Felling was done under the agency of contractors and each series was divided into three annual coupes. It was decided in 1940 that as the bamboo series of this division was in close proximity to the bamboo series of the Mettupalayam Range of Coimbatore North Division and as there was a misuse of the Coimbatore North Division bamboos under the cover of Nilgiri Division permits, the sale of the bamboo coupes of this division should be taken over by the District Forest Officer of Coimbatore North Division. The fact the coupes of this division were always worked by the contractors from Mettupalayam side was also taken into account before this change was effected. Though the sale of the coupes is done by the District Forest Officer of Coimbatore North Division the control of the forests and of the working in the coupes continues with the authorities of this division. The whole of Haduthorai and part of Kallur reserves had been permanently transferred to the neighbouring Coimbatore North Division during 1937.

229. *Exploitation of the minor forest produce.*—In the Mudumalai Range, the principal items of minor forest produce are honey, wax, horns, shekoy and gallnuts. They have been extracted departmentally till 1949, subsequent to which the right to collect all minor forest produce except sambhur and deer horns are being sold in annual public auction. The lease for the collection of the minor forest produce from the unreserves of Gudalur taluk is sold by the Revenue Department.

230. In Coonoor, Sigur and Ootacamund ranges the minor forest produce lease units included both the reserves and the unreserves, and the lease coincided with the fasli year. In each range the right to collect avaram and konnai barks and the right to collect blue-gum leaves were separate leases whereas all the other items of each range constituted a separate lease. Coonoor range was leased as one unit and Ootacamund and Sigur ranges joints as another unit.

231. Consequent to the bifurcation of Ootacamund range into Ootacamund North range and Ootacamund South range in 1949 the minor forest produce lease units of the division were (i) Mudumalai range, (ii) Sigur range and unreserves, (iii) Ootacamund North and South ranges and the unreserves and (iv) Coonoor range and unreserves. There is only one minor forest produce lease for each unit. In Sigur range certain areas are excluded from the lease for the collection of honey, wax and horns. The lease in Mudumalai and Sigur ranges excludes the collection of horns by the contractor. *Cassia fistula* bark is included in all ranges except in Ootacamund North and South ranges (where the species does not occur in workable quantities) on a five-year rotation.

232. *Regulation of grazing.*—In the early years prior to 1895 there was a distinction between agricultural and non-agricultural cattle and a full grazing fee of four annas a cow unit were levied on the non-agricultural cattle while half this rate was charged for the agricultural cattle. As it was found in practice that the distiuction led to a great deal of misuse because large number of cattle were passed off as agricultural cattle, the differential rates were abolished and a uniform rate of three annas per cow unit was charged throughout the Presidency according to G.O. No. 553, Revenue, dated 14th August 1895. In 1897 the grazing rules now embodied in the Forest Manual came into force. In 1900 free grazing of cattle, horses, asses and sheep was permitted in the Wenlock Downs. In 1914 it was decided that the Nilgiris division should be divided into five grazing blocks with a separate permit for each block and that the right of free grazing in the Wenlock Downs should be discontinued. However the existing practice of issuing free permits for Toda

buffaloes to all reserves open for grazing was continued. The five blocks that were accordingly constituted were (i) Kundah Block, 61,861 acres, (ii) Ootacamund Range excluding Kundah Block, 38,496 acres, (iii) Sigur Range, 63,500 acres, (iv) The Nilgiri Eastern Slopes, 10,675 acres and (v) Coonoor Range excluding the Nilgiri Eastern Slopes, 23,925 acres. Mudumalai Range was excluded from this arrangement. There was practically little grazing in that range. In 1926 instead of a grazing permit being issued to each block the facilities were extended so that a permit was valid for the whole range. In 1932 the validity of a grazing permit was extended as a general policy so as to cover the whole forest division. The grazing fees from 1895 when the distinction between the agricultural and the non-agricultural cattle was abolished to 1938 were on the same scale. In 1938 according to G.O. No. 836, dated 29th March 1938, the grazing fees were reduced by 50 per cent and they are in force even now. The grazing permit is valid for one year commencing from the first of July. The fee for penning licences prior to 1932, however, had been one-third less than the existing rates. The existing grazing fees are—

	RS.	A.	P.	
Buffaloes	0	3	0	per head.
Cows, bulls, asses, horses	0	1	6	do.
Sheep	0	0	9	do.
Foreign buffaloes	0	8	0	do.
Foreign sheep	0	2	0	do.
Slaughter Cattle for Mysore (permit valid for three days).				
Cows and bulls	0	1	6	per fifty per day.
Sheep and goats	0	0	9	do.

The fee for penning cattle in approved panne are charged at the rate of Rs. 1–8–0 for the first 100 cattle, Rs. 3 for the next 100 cattle and Rs. 4–8–0 for the next 100 cattle and so on. Chetti cultivators and Kurubars in Mudumalai range forests are given free grazing permits for voluntary assistance in fire fighting and fire protection.

233. A high proportion of the cattle that graze on the plateau are buffaloes. A good number of cows go out from Ootacamund to graze in the Downs are neither stall-fed or allowed to graze on the pastures available in the vicinity of their homes. The cattle resorting to the Kundahs and the adjoining reserves are owned by Todas and Badagas. The Todas are purely pastrol people who depend entirely on the cattle for their living. The Badagas are agriculturists who keep their cattle mainly for manure and partly for milch purposes. Cattle migration is a characteristic feature of the grazing of the Toda and Badaga cattle of the Nilgiri plateau. The buffaloes stay in the Toda munds on the Downs or in the Badaga villages from May to February. As soon as the season of frosts are over the Toda buffaloes migrate to the various munds in the Kundahs, while the Badaga buffaloes are sent out to a number of hundis or kraals, scattered over the Kundahs and the adjoining reserves. The buffaloes remain in the Kundahs till May when the thunder-storms preceding the south-west monsoon begin. The system of migration had been practised by the Todas from time immemorial and would appear to be a rudimentary form of rotational grazing practised for the following reasons : (i) scarcity of fodder in the Downs and in the vicinity of Badaga villages during the hot weather, (ii) availability of ample pasture in the Kundahs and the adjoining reserves due to the shortness of the period of grazing and better moisture conditions, (iii) buffaloes prefer the grass that come up after a burn and by adjusting their movement they could get more of such grass than if wedded to a permanent place (there is a belief that the consumption of the burnt ash taken with grass enables the buffaloes from the wasting effect of the monsoon), (iv) migration minimizes the risk of epidemic disease and (v) migration has a favourable influence on breeding.

234. *Burning of grasslands.*—Regular burning of grass is as characteristic a feature of grazing in the Nilgiri plateau as migration. The grasslands in the Downs and the Kundhas are burnt annually in order to obtain a fresh sprout of tender grass after the burn. This is an ancient custom of these pastoral people on the hills and had been officially recognized by Government. In recent years the burning is done under strict control so that the shola vegetation may not be endangered. Apart from the usual advantages claimed by the graziers for regular burning before the premonsoon showers, the Todas allege that the burning has the effect of destroying insects and fungi inimical to cattle and that it causes a general sterilization of the grasslands. If annual burning is not done they feel that the overgrown grass apart from being infested with pests injurious to cattle will be so overgrown that the firing of it would cause a more intense fire damaging the rhizomes.

235. A statement showing the number of animals that grazed during 1949–50, 1950–51 and 1951–52 in the reserves of the Nilgiris division is given in Appendix VI of this working plan.

236. A list of Toda munds, Badaga hundis and other pens in the Nilgiris division is contained in Appendix VII to this working plan.

237. Though the grazing of the cattle was allowed in the reserves under the cover of a permit, paid for or free as the case may be, certain areas were always closed for grazing like the plantations on the plateau and the Golf Course in the Downs, or closed for a specified period for silvicultural reasons as in the case of the teak plantations in Mudumalai range and the like. After the occurrence of any wanton firing a closure was always made both for a specified period both as a silvicultural measure and as a deterrent. In order to prevent effectively the illicit grazing in closed areas and young plantations the compounding fee per cow-unit was enhanced during 1948 as a special case to a limit of Rs. 2 per cow-unit instead of the usual limit of ten times the grazing fee which was not found to be a sufficient deterrent as the existing fee for a cow-unit was Re. 0–1–6.

238. *Cultivation of lac.*—Ranganathan's working plan (1938–48) provided for the cultivation of lac on certain *Schleichera trijuga* trees on the banks of the Moyar separating Mudumalai and Sigur ranges. One thousand one hundred and fourteen trees were selected and divided into four infection groups for infecting with the kusum brood of Laccifer lacca insects. Though some lac crops were harvested up to 1941 the results of the operation were far from satisfactory. From the very beginning it was observed that, though there was a reasonably good emergence of the insects, there had been constant failure to settle, with the result that the incrustation was imperfect. Most probably the atmospheric conditions especially during the night when the temperature falls below 50° F had an unsettling effect on the newly emerged insects. Due to the consistent failures in the production of lac in this region the cultivation of lac was discontinued from 1942.

239. *Fuel for Badaga villages.*—During the time of Commissioner Breeks certain charity topes of blue gum were formed, one in Kaguchi village (S. No. 169), one in Ebbanad village (S. No. 323) and another near Ootacamund. When the revenue settlement of the Badaga villages was completed in 1880 these plantations were registered as Dharma-topes. Efforts were made to preserve the sholas from destruction and selection of areas for reservation under the Forest Act was under progress. The following statement of Collector MacCartie made in 1890 indicates the state of forest vegetation in the vicinity of the Badaga country : "No people need protecting against themselves more than the Badagas. They have systematically destroyed every tree in the neighbourhood of their villages and for miles around, leaving nothing standing for their requirements but stunted shrubs such as Dodonea, Berberis, Carissa, etc. This has brought its own punishment, for the Badagas have to travel miles to obtain timber and fuel. The waste lands now available for sale are mostly worthless for cultivation, being rocky or very steep, and it is better that such lands should be planted up with *Acacia decurrens* and Eucalyptus of various species rather than be allowed to lie waste as now." Conservator Campbell Walker supported the Collector's move to reclothe the denuded lands. In an endeavour to remedy the evils wrought by Badagas and to provide them with timber and fuel, proposals were made in 1892 by Collector Rees for starting small plantations with *Eucalyptus rostrata* (red gum), *Acacia dealbata* and *A. Melonoxylon.* By the end of 1893–94 Morgan formed two plantations—Kaguchi (60 acres) and Kunnur (10 acres). Though by 1894–95, 80 acres at Kaguchi, 10 acres at Kunnur, 42 acres at Uppatti and 2½ acres at Kengal were planted only, 6, 2½, 3 and ½ acres respectively succeeded. However the plantations were continued and the following plantations were raised from 1894 to 1898 :—

Year of Formation.	Name of Block.	Area in acres.
1894–95	Kunnur	77
1895–96	Uppatti	96
1896–97	Kengal	8
1897–98	Kadanad	7

Over 27 different species of Eucalyptus, *Acacia dealbata, A. melonoxylon, Grevillea* and *Cupressus* species were tried. In 1898 according to Douglas 's suggestion further operations were stopped by the Board as the results were far from encouraging.

240. Though it was also suggested by Douglas that the progress should be watched and the matter reviewed at the end of five years, nothing more had been done in the way of raising Badaga Fuel Plantations. Instead in 1902 the system of issuing permits at the rate of one rupee per annum per household to the Badagas allowing them to collect dead and dry firewood from the reserved forests, was ushered in. The system naturally led to the gradual destruction of the sholas. But the pernicious system is still in force. The evils of the system are patent. The selling of the permits is a difficult and thankless task, as the Badagas are unwilling to pay for the firewood. The absence of a limit to the quantity of firewood that can be removed during the year (commencing from 1st July) and the difficulty in watching removals other than the dead and dry firewood lend the

system to be abused very easily. Recently most of the lands around the Badaga villages have been converted into potato fields and the position regarding fuel supplies has become more acute. About 650 permits in Coonoor and Ootacamund ranges and about 30 permits in Sigur range are annually issued.

241. *Fire protection in Mudumalai Forests.*—The early attempts at fire protection were confined to areas under working and the protection of the forest as a whole was not considered at all till the introduction of Cox's plan in 1910. A system of exterior and interior lines, totalling to a length of 120 miles with the employments of fire-patrols during the fire-season was introduced and tried till 1922 though not very successfully. In 1922 the system of early burning was introduced. All blocks other than Teppakadu Block came under the new system. The protection by firelines and patrols continued in Teppakadu Block. It was noticed in Doddakatti Block that all natural regeneration of Shorea talura was destroyed during the early burning and the old system was revived in 1926. A two-furlong wide fire line between the Mysore forests and Mudumalai forests was cleared and burnt. Under the initiative of Dyson all early burning was stopped in 1926 in all the areas as the fires were found to be too severe to affect all undergrowth and also to cause the grass to establish more firmly than before. When Hick's plan came into force in 1928 a system of fire protection which was a combination of both early burning and maintenance of firelines was prescribed. It was tried for three years and given up due to disappointing results. In October 1930 a reversion was made to the old system of burning only firelines. The firelines to be burnt were divided into three categories, namely, the external lines, block lines and internal lines and detailed instructions of the width of the guide lines to be cut and date of burning in each case was given. A similar system was continued in Ranganathan's plan (1938-48).

242. *Fire protection of the plateau forests.*—This falls under two heads: (i) the protection of the plantations and (ii) the protection of sholas. The plantations have always been effectively protected by means of scraped lines usually 6 feet wide running all along the periphery. The system is in vogue at present.

243. The protection of the sholas have always been complicated by the long standing practice of burning grasslands by the Todas and Badagas in the interests of grazing. This immemorial custom was given official sanction in 1905 as Government after enquiry came to the conclusion that the fires on the Nilgiris plateau did no appreciable damage. It was suggested that the special precautions that were taken in Wenlock Downs and the nearby sholas to prevent the fires of the grassland spreading into the sholas, should be extended to all sholas and their boundaries should be scraped. This however was not done. In 1915 Cox brought forward facts to indicate that the fires from the grasslands do damage the sholas and impressed upon the necessity to review the Government order of 1905. Nothing however was done till the Forest Commissioner of the Board (Couchmen) inspected in 1918 and wrote that in view of the great importance of preserving the sholas the Forest department must not shrink from incurring expenditure and since the fires are lighted in the interests of a few thousands of local cattle it would not be difficult to regulate the burning instead of allowing the fires sweeping over the whole plateau. In 1920 Conservator Tireman submitted proposals for regulating grass burning in the plateau, by setting apart sufficient areas for each Todamund or Badaga hundi at the rate of three acres per buffalo and protecting from fires the rest of the grasslands by cutting certain firelines or bridle paths. In 1924 a modified scheme allowing four acres for each buffalo and allowing burning in one half of the areas allotted to each mund of hundi in rotation as well as carrying out departmental burning in the unprotected areas was put forth by Currie. The scheme involved a vast network of lines and proved to be difficult to be put into practice. Hence in 1926 Dyson revised the scheme by dividing the Kundahs and the adjoining reserves into five blocks using the natural features as their boundaries. Two blocks where the country contained heavy shola or was steep were completely prohibited from burning, whereas in the other three blocks unrestricted burning was permitted. This scheme due to its simplicity and minimum interference with the local practice worked fairly satisfactorily. In 1934, Browne effected certain changes the most important of which is the condition that even in the areas where graziers were permitted to do burning, it has to be done under the departmental supervision with the help of men sent by the graziers. The controlled burning at the cost of the graziers under departmental supervision which is still in vogue is a notable advance in this direction and the fire protection of sholas is satisfactory.

244. Provision for the migratory cattle was made in Ranganathan's plan (1938-48) by the constitution of grazing blocks around 19 hundis in the case of Badaga Cattle and 11 munds in the case of Toda cattle. In allotting the blocks an allowance of 8 acres for each buffalo was made in the rotation system. Burning was to be done on a cycle of two years, each block having been divided into two compartments. Burning was to be done under departmental supervision with the help of or at the cost of the graziers concerned.

Departemntal supervision ensured the fire protection of the sholas within the grazing blocks. Burning was to be done away form the sholas leaving a strip of 10 yards around the sholas unburnt. In case firing had to be done towards the shola, a fireline was to be burnt along the edge of the shola first of all, so as to prevent the fire entering the shola.

245. Ranganathan's plan provided for the maintenance of a number of firelines in each of the ranges of the division and the employment of fire patrols during the fire season. The cost of fire protection for the whole division from 1938–39 is given below :—

	RS.	A.	P.
1938–39	2,787	0	0
1939–40	2,621	8	0
1940–41	2,710	8	3
1941–42	2,503	0	0
1942–43	2,792	1	0
1943–44	3,443	0	0
1944–45	3,976	0	0
1945–46	3,660	0	0
1946–47	5,331	0	0
1947–48	4,595	0	0
1948–49	2,415	0	0
1949–50	3,613	0	0
1950–51	4,009	0	0

Section 3—Special works of improvement undertaken.

246. *Efforts on the afforestation of the Kundahs.*—A number of experiments in afforestating the grasslands or patches where the sholas have almost disappeared were tried near Avalanche, Lakkidi, Bangitappal and elsewhere in the Kundahs between the years 1922 to 1926. The species tried were *Gypress, alnus nepalensis, Acacia dealbata, Calitris rhombhoidis, Salix tetrasperma Eucalyptus, Rhododendron,* etc. Although the degree of success achieved was small *Acacia dealbata* and *Calitris* showed some promise. No work was done from 1926 to 1932 in the matter of afforestation of this tract, as Government were contemplating grant of lands for tea cultivation. In 1932 afforestation work was resumed on a small scale. Two plots were opened at Bangi Tappal and the species tried were *Hakea saligna, Calitris* and *Cypress.* Planting was also done along the margin of the Avalanche—Lakkidi bridle path. In 1933 two plots at Lakkidi and one at Billithadahalla were opened. The latter was mainly intended with the object of starting a small fuel series to supply the fishing hut. Acacia dealbata was also tried, and it was found to show promising results. In 1934 apart from replacing casualties in the plots already raised, a plot of about an acre each was taken up near Jacko Nullah, Fife's Covert and Mukurti Hut. Hakea, Ash and *Ligustrum roxburghii* were tried at Jacko Nullah, Hakea and Rhododendron in Fife's Covert and Calitris and *Acacia dealbata* near Mukurti Hut. No new regeneration plots were laid as regards afforestation of the Kundahs or other grasslands areas after 1935 as the degree of success achieved in the previous areas was very small.

247. *Planting Blue Gum for fuel supply to Naduvattam.*—In the years 1935 and 1936 two five acre plots were planted with blue gum in Naduvattam No. 1 reserve with the object of supplying firewood to Naduvattam. Ranganathan's plan also provided for the extension of the plantations so as to form a complete fuel series. Grassy areas about five acres per annum were planted with blue gum in the vicinity of Naduvattam from 1938 to 1943. The results of the plantations were not satisfactory. The stocking and the rate of growth was very poor and the demand for firewood also became less acute due to supplies from the neighbouring estates and the Cinchona plantations. The planting of blue gum in the vicinity of Naduvattam was therefore stopped from the year 1944.

248. Experiments with new species like Eucalyptus diversi-colour (Karrie), *Eucalyptus marginata* (Jarrah) and *Eucalyptus radiata* were tried in 1950. Some seedlings of *Eucalyptus radiata* and *Eucalyptus diversi colour* which were planted as mossed seedlings in July 1950 in Aramby Block V. compartment 9 attained a height of about four feet by July 1951.

249. *Improvement of water-supply to Kargudi.*—Since the Kargudi camp was built water was carried up hill in carts till 1926. In 1926 a hydraulic ram was installed near the camp at a cost of Rs. 919–5–0. The ram delivered water into a cistern near the Range headquarters and water for the Rest House was taken from there in a cart. The ram was not found to be working satisfactorily at the time Ranganathan's plan was drawn up owing to shortage of water in the stream and due to seepage through the dam. At present water for the camp is taken from the Moyar near Lower Kargudi by a cart, as the ram had fallen into disuse. Efforts to sink wells in the neighbourhood of the Camp had always ended in failure as no water was struck within a reasonable depth. It may be mentioned in this connexion that 1914 a pump obtained from Mount Stuart was installed to pump water

from near Lower Kargudi to the Rest House and the range headquarters. The pump failed to work satisfactorily, and an amount of Rs. 3,179 was spent on installation, erection of iron cisterns, the laying out of pipes, etc. The pump set was handed over to the Madras Forest College in 1920.

250. *Roads.*—A list of departmental roads in the Nilgiris Division is contained in Appendix VIII to this working plan.

251. *Buildings.*—A list of departmental buildings in the Nilgiris Division is given in Appendix IX to this working plan.

252. *Cultivation of Pyrethrum.*—One of the special works that was undertaken during the years of World War II and not provided for in any of the working plans that covered the Nilgiris Division was the growing of *Chrysanthamum cinerarifolim* (Pyrethrum) flowers on a large scale.

253. The importance of Pyrethrum as an anti-malarial insecticide as well as for killing body lice and ticks came to the forefront during World War II in connexion with jungle warfare. Large demands were made by the military and the Government of India urged the different States that could grow pyrethrum to produce as much as they can and gave an undertaking to purchase the entire output of flowers at a specified rate. Any loss the local Government had to incur in the operation was also to be reimbursed by the Government of India as the production of pyrethrum was to be undertaken as a war measure. The Madras Government enbarked on an ambition scheme in the Nilgiris and the Palni Hills near Kodaikanal for large scale production of pyrethrum as the climatic conditions in those localities were the optimum for the growing of pyrethrum flowers of high pyrethrum content. In the Nilgiris Division the cultivation of pyrethrum commenced in the year 1943.

254. In the early stages the cultivation of pyrethrum was carried out under the control of the District Forest Officer, The Nilgiris Division. Subsequently a special forest division called the Pyrethrum Division was formed on 14th October 1943. The special division included on its staff one Assistant Conservator of Forests in charge of the division, 4 Rangers, 12 Foresters and 24 Forest Guards.

255. By the end of 1946 about 1,868 acres of land were brought under pyrethrum. About 270,635 pounds of flowers were produced at an expenditure of Rs. 11,83,693 and a revenue of Rs. 3,94,916 was realized by the sale of flowers.

256. The rate at which Government of India purchased the flowers in the year 1944 was Re. 1–4–0 per lb., in 1945, Re. 1 per lb., and from 1946 a provisional rate of Rs. 2 per lb. was fixed subject to revision after examination of the cost of production.

257. The areas that were planted up to 1946 and the particulars thereof are furnished below :—

Range.	Name of the plantation.	Areas in acres.	Year of planting.	Remarks.
I. West ..	Hecuba	129·40	1943	85 acres taken on lease.
	Hodgson's Hill	129·80	1943	
	Sholur	181·90	1943	
	Ree's Corner	80·23	1943	
	Do.	74·75	1944	
II. North-west ..	Muthinad	154·00	1943	
	Do.	37·10	1944	
	Brookhampton	218·45	1943	
	Do.	139·75	1944	
III. East	Mainalai	22·70	1943	
	Do.	57·50	1944	22·5 acres unreserve.
	Jacundah	25·87	1943	
	Honnathalai	40·90	1943	
	Do.	14·10	1944	
	Kodanad	23·77	1943	
	Do.	7·30	1944	
	Newman	29·12	1943	
	Bettumund	59·90	1944	0·70 acres unreserve.
	Rallia	10·70	1944	5·45 acres unreserve.
IV. North-east ..	Thuneri	51·62	1943	Unreserve.
	Do.	25·43	1944	Land taken on lease.
	Thummanahatty	207·28	1943	Unreserve.
	Ebbanad	105·84	1943	Reserve.
	Iduhatty	40·11	1944	Unreserve.
		1,867·52		

258. Of the 1,867·52 acres that were planted with pyrethrum, 327·66 acres were Government unreserves, about 110 acres were private lands taken on lease and the rest were within the reserved forest limits.

259. With the cessation of hostilities connected with World War II, the Government of India served a notice on the Madras Government that they would not make good any loss incurred by the Madras Government by the cultivation of pyrethrum subsequent to 31st December 1946 and that the cultivation of pyrethrum from 1st January 1947 was purely the concern of the local Government. From 1st January 1947 to 1948–49 the output of pyrethrum was 55,607 pounds and an expenditure of Rs. 2,75,428–8–0 was incurred. The pyrethrum flowers produced during this period was supplied to the Government Kerala Soap Factory on a provisional rate of Rs. 2 per lb. The revenue obtained during the period was Rs. 2,19,255–1–2. The increase in revenue during this period when compared with the period 1944 to 1946 referred to in paragraph 257 is due to the lease of lands from 1947 onwards for potato cultivation prior to planting with pyrethrum. The system was adopted with the pious hope that apart from obtaining good lease amounts from potato cultivators, which would wipe off the deficits arising from the heavy expenditure incurred in the production of flowers, the tilling of the soil and the manuring of it with the potato manure would help the pyrethrum grow better. Alas, the contrary happened. The output of pyrethrum flowers in the areas where potato had been grown was found to be miserably small. It is hoped that with the land lying fallow for few years or with suitable culturable operation the acidity of the soil will be neutralized and the pyrethrum grown successfully. The system of leasing lands for potato cultivation prior to pyrethrum cultivation had however since been given up.

260. The reasons for the heavy loss incurred in the growing of pyrethrum are difficult to assess. Growing pyrethrum was a new venture to the Forest department and the urgency for the need of pyrethrum during the war and the guarantee against loss appear to have encouraged a scale of expenditure foreign to normal operations. The very scattered nature of operations militated against economy and adequate supervision. Many labour lines and driers for drying the flowers had to be constructed at a heavy cost.

261. The notice given by the Government of India to the effect that the production of the pyrethrum from 1st January 1947 was purely the concern of the local Government and the heavy expenditure incurred up to that time made the Madras Government to take stock of the position in June 1947. It was ordered in G.O. No. 4059, Development, dated 13th August 1947 that the cultivation of pyrethrum in the Palnis (near Kodaikanal) should be discontinued and that it may be continued in the Nilgiris on a limited scale sufficient to meet the requirements of the Madras Government. Accordingly it was decided that that the area under pyrethrum in the Nilgiris should be reduced to about 600 acres and the other areas be converted into wattle plantations. An annual output of about 60,000 pounds of flowers (dry) was expected under the new proposals.

262. A combined scheme for pyrethrum and wattle cultivation based on the above decision was made by Sankaranarayana Rao, District Forest Officer of the Pyrethrum Division and the salient features of the scheme were : (i) Reduction of the four special pyrethrum ranges to two with the proportionate reduction in staff. Two ranges—East and west were formed with 8 foresters and 12 forest guards. (ii) Reduction of pyrethrum areas to eleven localities measuring 663·27 acres and most of the other pyrethrum areas (about 1,100 acres) to be converted into wattle plantations. The areas retained under pyrethrum were—

	ACS.
Ree's corner	154·98
Muthinad	71·00
Brookhampton	111·50
Mainalai	80·20
Jacundah	25·87
Honnathalai	55·00
Newman	29·12
Bettumund	59·90
Rallia	10·70
Rhummanahatti	55·00
Iduhatty	10·00
Total ..	663·27

The cultivation of wattle was to be on the following pyrethrum areas to the extent indicated below :—

	ACS.
Kodanad	31·07
Hecuba	129·40
Hodgson's Hill	129·80
Sholur	181·90
Brookhampton	196·70
Muthinad	120·10
Thuneri	51·62
Thummanahatty	117·28
Iduhatty	30·11
Ebbanad	105·84
Total	1,093·82

(iii) Pyrethrum was to be cultivated on five-year cycle as the yield fell greatly after the fourth year. (iv) Wattle to be planted within three years in the areas set apart for it. (v) Pyrethrum and Wattle planting to remain as a separate division.

263. In 1948 Government ordered that the separate division for pyrethrum and wattle planting be abolished and amalgamated with the Nilgiris Division as a measure of retrenchment and the amalgamation was effected on 1st October 1948.

264. When the growing of pyrethrum came under the control of the Nilgiris Division, the scheme of Sankaranarayana Rao was scrutinized by the then District Forest Officer, Lasrado, with a view to grow pyrethrum as economically as possible without impairing the efficiency of production.

265. It was found that the 663·27 acres chosen by Sankaranarayana Rao were scattered over 11 widely separated areas and would not contribute to efficiency or economy. The territorial control of the pyrethrum areas was in the hands of the Range Officer, Ootacamund Range, while the planting and harvesting of pyrethrum were done by the Special Pyrethrum Range Officers with the special staff. This resulted in two sets of subordinates covering the same area which was not only uneconomic but contributed to much friction. Some of the areas that were included in the 663·27 acres were those temporarily loaned from the Revenue Department during the emergency caused by the war. They were mainly communal grazing grounds and there was clamour from the villagers for the return of the areas for grazing purposes. Loss in production was experienced from illicit grazing of the pyrethrum areas.

266. It was therefore proposed that the Ootacamund Range be bifurcated into Ootacamund North and Ootacamund South Ranges and the pyrethrum work done by the territorial Rangers after abolishing the posts of the two Special Pyrethrum Rangers. These proposals were approved and the bifurcation of Ootacamund Range was effected on 1st September 1949.

267. According to Lasroda's Scheme (1948–53) the cultivation of pyrethrum was to be made over an area of 653·53 acres divided into three planting series, (i) Ree's Corner series, 154·98 acres, (ii) Muthinad series, 176·85 acres and (iii) Brookhampton series, 321·70 acres. The cultivation of the flowers was to be done on a rotation of 6 years (3½ years under pyrethrum and 2½ years under food crop, cereals or grass cultivation). Potato cultivation was also contemplated but the bitter experience since gained showed that pyrethrum fared very poorly in the areas where potato was cultivated with manure prior to pyrethrum planting in the same area.

268. During the years 1948, 1949 and 1950 an area of 86, 123 and 100 acres respectively were planted. The yield of dry flowers obtained from them was 2,360 lbs. 1 lbs. and about 30 lbs. till the end of 1952. The effects of past potato cultivation were evidently the cause of the series of failures from 1948. In 1951 the proposed area of 132 acres of Ree's Corner was not planted for want of planting material. Seeds obtained from Japan when tried in the seed beds failed to germinate. A new area of about 5 acres near Brookhampton and 8·6 acres in the same area left out in 1950 were planted in 1951 with pyrethrum with the available planting materials.

269. The following statement gives the particulars of expenditure incurred on the 1,867 acres planted during the years 1943–44 and 1944–45 :—

	RS. A. P.	RS. A. P.
(i) Preparation of the planting area by forking, breaking the clods, removing the stones and roots and placing them along contours.	1,97,932 11 0	106 0 3
(ii) Planting pyrethrum including casualty replacement.	74,251 11 0	39 9 3
(iii) Protection including permetre trenches, fences, etc.	50,669 2 9	27 2 3
(iv) Weeding and soil working	1,29,558 13 6	69 6 3
(v) Maintenance of contour and side drains ..	14,427 6 6	7 9 6
(vi) Paths, minor constructions, etc.	5,557 9 6	2 15 7
Total ..	4,72,397 4 3	252 11 0

On the formation of nurseries amounting to 2,950 seed beds in 1944–45 and 11,097 seed beds in 1943–44 an expenditure of Rs. 1,61,235–11–0 was spent. The cost of nursery per acre of plantation works to Rs. 86–5–9.

270. For the drying of the pyrethrum flowers harvested from the plantations, ' driers ' had to be constructed near the plantation sites. Seven such driers were constructed at a cost of Rs. 37,390–10–10 and thirteen labour hutments were constructed at a cost of Rs. 64,755–3–6.

The yield obtained from 1943–44 to 1948–49 from the plantations of 1943 and 1944 as follows :—

Year.	Area in acres.	Yield of flowers.		Yield per acre.	
		Fresh.	Dry.	Fresh.	Dry.
(1)	(2)	(3)	(4)	(5)	(6)
1943–44	1,400	1,053	..	..	..
1944–45	1,400	441,475	107,912	316	77
1945–46	1,800	377,654	96,561	210	54
1946–47	1,800	356,974	89,129	198	50
1947–48	948	120,433	31,113	127	33
1948–49	660	25,540	6,244	39	10
				890	224

It will be seen that about 100 lb. of fresh flowers yield on drying about 25 lb. of dry flowers.

271. *Wattle plantations.*—The creation of wattle plantations is one of the special works undertaken in the Nilgiris Division during the past decade. The work had not been covered by any working plan. It was started on an experimental scale and it gained impetus as the trade relations with South Africa became strained and the imports of wattle bark dwindled. The wattle planting commenced in the year 1939 and small plantations were raised in scattered acres all over the plateau. The compact regeneration areas on a large scale lie at present near Mukurti.

272. In G.O. Ms. No. 3097, Development, dated 14th December 1949, the Chief Conservator of Forests was asked to investigate into the possibility of growing wattle on a large scale in selected areas in the Nilgiris and the Palnis. Accordingly a scheme was drawn up in 1939 by Browne which provided for the starting of experimental plantations over small areas from 1939 to 1942 ; and in the event of the plantations proving successful it was proposed to undertake regular plantations on a large scale. Experimental plantations were raised in different localities in Coonoor and Ootacamund Ranges and by 1940 an area of 693 acres were brought under wattle.

273 } *Omitted.*
274 }

275. In addition to the scattered plantations raised from 1938 and the plantations raised in the old pyrethrum areas, it was proposed to bring about 6,000 acres under regular plantations in the Nilgiris. A scheme was made by Sankaranarayana Rao in 1948 which contemplated the planting of wattle in six series on a rotation of ten years. The series included in the scheme were Naduvattam, Mukurti Lake North, Mukurti Lake South, Avalanche, Bikkatti and the Kundah series. The scheme was sanctioned in G.O. No. 3628, Development, dated 7th July 1949. An area of about 600 acres were to be planted up in as many places as possible in the places indicated, not exceeding 250 acres in any one locality so that there may not be difficulty in the procurement of labour. It was provided that wherever possible the plantations will be raised by the tuckle method and by co-operative efforts. Planting of nursery raised seedlings in prepared pits at an espacement of 10 feet by 10 feet was prescribed. Provision for adding manure to the pits and for the digging up of contour trenches as a measure of soil protection and moisture conservation were also made.

276. Certain amendments to the wattle scheme mentioned above were proposed in 1949 by the District Forest Officer. Instead of planting green wattle (*Acacia decurrens*) planting was to be done in future with *Acacia mollissima* (black wattle) which is most desired by the tanners. The selection of area to be planted with wattle was to be left to the discretion of the District Forest Officer and there was to be no restriction on the annual area to be planted in any particular locality though a total area of about 800 acres in the division would be planted annually. Instead of an espacement of 10 feet by 10 feet planting of wattle was to be done at 11 feet by 11 feet in 60 rows alternating with five rows of blue gum at 11 feet by 11 feet to serve as wind breaks. It was also provided that for the first three years alternate stakes in each wattle line be sown with wattle seeds and the rest planted with wattle line be sown with seedlings. The amendments also involved the abandoning of the elaborate soil conservation measures, the shading of the plants only in the hollows, and artificial manuring of the plants at four ounces of superphosphate manure instead of two ounces, prescribed in the original scheme.

277. In the grasslands along the Mukurti Road two plantations were raised during the years 1950 and 1951. In 1950 an area of 555 acres were planted departmentally at a cost of Rs. 20,778, i.e., at Rs. 36 per acre. The alternate stakes that were sown were not successful. The seedlings that were planted came up well, but subsequently suffered during the frosty reason. Frost cover was not done to all plants and was confined only to those in the hollows. The damage by frost to the seedlings and the failure of the sowings made it necessary to replace the casualties at a cost of Rs. 73,792, i.e., at Rs. 24 per acre over a large area in the next year. In 1951 an area of 355 acres were planted in the same locality at a cost of Rs. 14,920, i.e., Rs. 42 per acre. No sowings were done and the entire area was planted up with mossed seedlings. Frost covering was done to all the plants below 1½ feet in height instead of confining to those in the hollows. Unfortunately a fire that broke out during the beginning of the summer in 1952 affected nearly 125 acres of the plantation. Manuring was not undertaken as it was costly and it was confined to an experiment of 50 acres in the 1951 area using about two ounces of manure to each pit. The Mukurti area not only suffers from frost, which disheartens the efforts at artificial regeneration of wattle but also suffers from want of sufficient labour. A labour line is under construction and it is hoped that this will solve the problem of labour to a great extent.

278. Including the 910 acres planted near Mukurti, from 1939 to 1951 an area of 2,457 acres had been brought under wattle. In 1952 an area of 255 acres and in 1953 an area of 272 acres in Mukurti area were planted with wattle. In the Mukurti area no tuckle cultivation was done prior to planting with wattle. In most of the other areas planted during or after World War II wattle was grown after potato cultivation.

279. A statement of the wattle plantations raised in the Nilgiris Division and important particulars relating to them are given in Appendix X to this Working Plan.

Section 4—Past yield.

280. Statements showing the outturn of timber, firewood, sandal wood, etc., are given below:—

(a) Timber.

(i) Yield from clearfellings for conversion into teak plantations.

Year.	Compartment number.	Acreage.	Species.	Outturn in cubic feet.
1938–39 ..	2 (part)	20·2	Teak	6,590
			Mathi	878
			Vengai	303
			Venteak	419
			Grewia	1,250
			Total ..	9,440
1939–40 ..	2 (part)	22·2	Teak	6,154
			Rosewood	46
			Vengai	50
			Venteak	944
			Total ..	7,194

(*a*) *Timber*—cont.

(i) Yield from clearfellings for conversion into teak plantations—*cont.*

Year.	Compartment number.	Acreage.	Species.	Outturn in cubic feet.
1940–41 ..	2 (part)	20·7	Teak	6,078
			Rosewood	33
			Mathi	133
			Vengai	38
			Venteak	130
			Total ..	6,412
	1 (part)	15·0	Teak	2,783
			Rosewood	70
			Vengai	38
			Miscellaneous	165
			Total ..	3,056
1941–42 ..	2 (part)	16·9	Teak	4,290
			Mathi	37
			Vengai	91
			Miscellaneous	501
			Total ..	4,919
	2 (part)	31·8	Teak	8,093
			Mathi	557
			Vengai	244
			Venteak	53
			Rosewood	5
			Total ..	8·952
1941–42 ..	19 (part)	21·5	Teak	6,774
			Mathi	367
			Rosewood	285
			Vengai	340
			Venteak	281
			Miscellaneous	516
			Total ..	8,563
1942–43 ..	19 (part)	39·0	Teak	11,432
			Rosewood	12
			Mathi	929
			Vengai	109
			Venteak	452
			Miscellaneous	146
			Total ..	13,080
	18 (part)	20·8	Teak	4,583
			Rosewood	98
			Mathi	233
			Vengai	144
			Venteak	132
			Miscellaneous	59
			Total ..	5,249
	6 (part)	12·0	Teak	2,984
			Mathi	105
			Vengai	322
			Venteak	98
			Total ..	3,509
1943–44 ..	18 (part)	38·0	Teak	10,014
			Rosewood	716
			Mathi	768
			Vengai	852
			Venteak	458
			Total ..	12,808

(a) *Timber*—cont.

(i) Yield from clearfellings for conversion into teak plantations—*cont.*

Year.	Compartment number.	Acreage.	Species.	Outturn in cubic feet.
1944–45 ..	No working as a result of Military occupation of the area.			
1945–46 ..				
1946–47 ..				
1947–48 ..	20 (part)	22·0	Teak	1,175
			Rosewood	885
			Mathi	3,275
			Vengai	537
			Venteak	1,190
			Grewia	534
			Vagai	33
			Padiri	11
			Total ..	7,640
1948–49 ..	3 (part)	23·5	Teak	2,755
			Mathi	1,436
			Venteak	1,042
			Rosewood	401
			Grewia	53
			Total ..	5,687
1949–50 ..	3 (part)	32·5	Teak	3,374
			Mathi	2,984
			Venteak	803
			Rosewood	444
			Grewia	48
			Miscellaneous	4,494
			Total ..	12,147
1950–51 ..	3 (part)	25·5	Teak	4,484
			Mathi	600
			Venteak	194
			Rosewood	143
			Grewia	39
			Miscellaneous	6,610
			Total ..	12,470
1951–52 ..	19 (part)	25·3	Teak	4,484
			Mathi	600
			Venteak	194
			Rosewood	143
			Grewia	39
			Miscellaneous	6,610
			Total ..	12,470
1951–52 ..	3 (part)	16·5	Teak	2,235
			Mathi	698
			Venteak	289
			Rosewood	263
			Grewia	115
			Total ..	3,600

(ii) Selection fellings.

Year.	Compartment number.	Acreage.	Species.	Outturn in cubic feet.
1938–39 ..	26	2,096	Teak	38,534
			Rosewood	5,499
			Mathi	152
			Vengai	22,577
			Venteak	3,802
			Total ..	28,797

(a) *Timber*—cont.

(ii) Selection fellings—*cont.*

Year.	Compartment number.	Acreage.	Species.	Outturn in cubic feet.
1939–40 ..	21	1,296	Teak	18,365
			Rosewood	705
			Vengai	3,374
			Venteak	368
			Grewia	77
			Total ..	22,889
1940–41 ..	23	1,366	Teak	18,365
			Rosewood	705
			Vengai	3,374
			Venteak	368
			Grewia	77
			Total ..	22,889
1941–42 ..	No felling as the area was infected with anthrax.			
1942–43 ..	20	1,358	Teak	16,079
			Mathi	38,918
			Vengai	1,056
			Venteak	3,425
			Total ..	59,478
1943–44 to 1946–47.	No fellings, due to Military occupation of the area.			
1947–48 ..	24	986	Teak	25,677
			Rosewood	730
			Mathi	15,716
			Vengai	1,528
			Venteak	905
			Total ..	44,556
1948–49 ..	25 (part)	1,200	Teak	31,374
			Rosewood	2,945
			Mathi	10,536
			Vengai	2,053
			Venteak	1,183
			Total ..	48,291
1949–50 ..	25 (part)	91	Teak	621
			Miscellaneous	5,000
			Total ..	5,621
	39 (part)	700	Teak	30,967
			Rosewood	274
			Mathi	23,623
			Vengai	2,651
			Venteak	571
			Total ..	58,086
1950–51 ..	39 (part)	506	Teak	21,442
			Rosewood	1,823
			Mathi	11,700
			Venteak	1,995
			Vengai	1,292
			Grewia	186
			Miscellaneous	10,000
			Total ..	48,438
	38 (part)	350	Teak	9,491
			Mathi	12,052
			Vengai	1,164
			Venteak	212
			Total ..	22,919

(a) *Timber*—cont.

(ii) Selection fellings—*cont.*

Year.	Compartment number.	Acreage.	Species.	Outturn in cubic feet.
1951–52	38 (part)	435	Teak	14,928
			Mathi	13,253
			Vengai	1,688
			Venteak	1,168
			Rosewood	794
			Total	31,831
	29 (part)		Teak	21,220
			Mathi	14,442
			Vengai	1,913
			Venteak	917
			Rosewood	653
			Grewia	266
			Total	39,391

(b) *Fuel* (*Bluegum*).

Year.	Locality.	Block or compartment number.	Acreage.	Yield in cubic feet.
1938–39	Aramby	III 7	5·6	15,550
		V 1 and 4	10·4	65,750
	Baikee	IV 4 and 5	19·2	87,750
	Snowdon	II 3 b	4·2	10,550
	Huppatty	V 2	10·5	66,700
	Coonoor Peak	I 3	8·2	40,575
		I 8	4·8	30,975
	Bandyshola	18	2·0	11,700
		19	3·8	8,300
		Total	68·7	337,850
1939–40	Aramby	V 3	6·4	33,050
		II 5	3·1	17,650
	Cairnhill	II 19	5·6	31,450
		II 18	5·1	37,450
	Snowdon	II 8	5·2	19,400
	Huppatty	V 1	3·5	33,050
	Governorshola	VI 3 b	6·6	44,050
	Coonoor Peak	I 4	5·2	38,750
		I 12	5·1	23,425
	Bandyshola	20	4·7	10,275
		Total	50·5	289,050
1940–41	Aramby	V 5	5·3	33,760
		V 6	7·4	51,480
	Cairnhill	II 14	3·8	26,040
	Baikee	IV 3	9·9	69,300
	Snowdon	II 4	18·7	68,820
	Andy	VI 1	9·1	37,680
	Coonoor Peak	I 13	1·9	15,600
		I 15	3·7	24,000
		I 16	3·1	24,960
		I 17	3·6	12,000
	Bandyshola	21	4·8	33,600
		Total	71·3	397,240
1941–42	Aramby	II 6 and 7 ; III 8.	15·2	51,800
	Cairnhill	II 1 and 2 ; II 8.	15·7	80,650
	Snowdon	II 6	16·3	92,600
	Kalli	II 1 and 2	21·3	67,450
	Coonoor Peak	I 14	3·5	21,825
		I 18	7·4	47,525
	Bandyshola	23	1·8	11,675
		24 (part)	1·5	13,925
		Total	82·7	387,450

(*b*) *Fuel* (*Bluegum*)—cont.

Year.	Locality.	Block or compartment number.	Acreage.	Yield in cubic feet.
1942–43 ..	.. Aramby	III 2 ..	8·7	40,600
		III 9 ..	9·6	39,600
	Cairnhill	II 10 ..	2·1	16,900
	Madana	IV 1 ..	9·5	49,800
	Snowdon	III 3 ..	4·8	25,600
	Chowghat Kalli ..	I 1 ..	14·6	22,350
	Coonoor Peak	I 24 ..	8·2	38,650
		I 22 ..	9·1	76,350
	Bandyshola	15 ..	3·6	22,590
		16 ..	1·5	5,900
	Bleak House	10 ..	6·9	61,835
		Total ..	78·6	400,175
1943–44 ..	.. Aramby	II 10 ..	3·5	18,540
		V 13 ..	3·6	17,760
		V 10 ..	1·0	9,660
	Madana	IV 2 ..	9·7	68,640
	Cairnhill	I 3 ..	10·3	90,240
		II 7 ..	5·6	40,500
	Snowdon	II 5-a ..	4·2	46,180
		II 5-b ..	5·5	54,000
	Chowghat Kalli	I 2 ..	12·2	85,920
	Sheffield	III -a ..	6·4	36,360
		III 1-b ..	8·1	47,160
	Muthinad	7 (part) ..	3·8	102,000
	Coonoor Peak	I 27 ..	5·5	42,000
		I 37 ..	6·0	42,000
		I 40 ..	5·3	34,680
	Blackbridge	1 ..	6·5	24,960
	Rallia	1 ..	2·1	12,000
		2-b ..	7·3	69.180
			106·6	841,780
1944–45	.. Aramby	II 12 ..	1·9	15,180
		III 15 ..	2·5	10,800
		II 1 ..	6·7	29,820
		III 1 ..	5·6	30,480
		III 2 ..	4·7	25,080
	Cairnhill	II 20 ..	3·6	27,720
		II 6 ..	4·6	24,840
		I 9-b 2 ..	3·5	21,720
		II 21 ..	4·5	33,600
		I 9-b 1 ..	2·7	23,880
		I 4-a 1 ..	3·5	28,320
		II 9 ..	3·5	25,200
	Marlimund	III 2-a ..	3·9	21,120
		III 2-b ..	3·4	28,980
		III 1 ..	5·6	32,520
	Doddabetta	5 ..	..	..
	Sheffield	III 2-a } III 2-b } ..	13·0	110,940
	Governorshola	VI 1 ..	12·1	31,800
		VI 4 ..	13·0	65,040
	Dharmatope	..	5·9	153,660
	Chemanguli	1 ..	3·8	36,720
	Coonoor Peak	I 39 ..	5·3	45,840
		I 19 ..	1·8	13,590
		I 23 ..	4·0	24,000
		I 29 ..	6·0	67,320
		I 1 ..	6·4	45,060
		I 30 ..	2·4	13,170
	Tiger Hill	1 & 2 ..	12·6	34,500
	Bandyshola	24 (part) ..	3·1	8,550
	Rallia	2-a ..	7·5	62,160
		8 ..	3·5	76,440
	Newman	4 ..	3·2	36,200
			167·8	1,221,225

(b) *Fuel (Bluejum)*—cont.

Year.	Locality.	Block or compartment number.	Acreage.	Yield in cubic feet.
1945–46 ..	.. Aramby	III 5 ..	2·5	10,800
		II 3 ..	2·8	20,460
	Cairnhill	II 18 ..	6·4	44,100
	Doddabetta	6 ..	5·5	29,280
	Muthinad	7 (part) ..	3·0	76,620
	Coonoor Peak	I 28 ..	3·8	21,720
		I 32 ..	5·4	31,020
		I 31 ..	5·0	30,210
	Bandyshola	24 (part) ..	3·0	8,550
			37·4	272,760
1946–47	.. Aramby	V 14 ..	3·8	23,100
		II 15 ..	2·6	12,780
		II 16 ..	3·3	16,500
		V 17-a ..	3·1	28,560
		VII 3-a ..	3·3	21,960
		VII 3-b ..	2·9	25,500
	Marlimund	III 5-a ..	4·0	14,100
		III 5-b ..	4·5	21,150
	Governorshola	VI 5 ..	10·5	42,420
	Chemanguli	2 ..	8·3	89,010
	Muthinad	8 ..	7·1	125,040
		9 ..	6·1	161,640
		10 ..	7·5	136,200
	Coonoor Peak	I 33 ..	4·9	23,460
		I 35 ..	6·1	48,780
		I 34 ..	6·8	37,980
	Bandyshola	10 ..	3·3	20,760
	Newman	7 ..	3·3	41,925
		8 ..	2·3	38,285
		6 ..	2·8	32,820
		9 ..	4·3	40,200
			100·8	998,170
1947–48 ..	.. Aramby	III 13 ..	13·5	59,820
		III 6 ..	5·7	25,800
		II 9 ..	3·9	17,920
		II 11 ..	3·8	14,040
		II 8 ..	2·5	21,660
	Cairnhill	II 5 ..	5·8	35,040
		II 17 ..	3·5	21,780
		I 4-a 2 ..	3·5	31,320
		I 4-a 3 ..	3·7	30,720
	Andy	IV 2-a ..	7·1	29,940
	Chemanguli	3 ..	14·0	102,530
	Blackbridge	1 ..	6·5	31,560
	Newman	1 ..	3·0	29,940
		5 ..	4·8	85,480
			81·3	527,550
1948–49 ..	.. Aramby	VII 4-a ..	3·2	23,460
		V 9 ..	3·4	17,880
		III 10 ..	3·6	21,405
	Baikee	IV 8 ..	14·1	55,215
	Snowdon	II 1-a ..	2·4	18,720
		II 1-b ..	2·7	19,920
		II 1-c ..	0·6	9,000
	Andy	IV 3 ..	9·3	22,140
	Muthinad	1-a ..	3·5	35,340
		1-b ..	2·8	23,520
	Coonoor Peak	I 36 ..	5·0	37,800
	Bandyshola	11 ..	2·9	10,920
		12 ..	2·9	12,240
	Blackbridge	3 ..	7·5	30,600
	Rallia	9 ..	3·0	27,120
	Newman	2 ..	2·6	23,160
	Little Rallia	1 ..	5·0	20,160
		2 ..	2·4	10,175
			76·9	418,775

(*b*) *Fuel* (*Bluegum*)—cont.

Year.	Locality.	Block or compartment number.	Acreage.	Yield in cubic feet.
1949–50 ..	.. Aramby	VII 3-c ..	4·0	33,600
		II 13 ..	2·5	14,400
		II 18 ..	9·0	31,200
	Cairnhill	II 3 ..	5·8	29,100
		II 16 ..	4·0	10,200
		II 19 ..	7·0	39,360
	Governorshola	VI 2-a ..	7·0	26,880
		VI 2-b ..	7·5	18,240
	Andy	IV 2-b ..	7·5	22,860
	Taneriffe Peak	II 2-a ..	3·2	32,760
		II 2-b ..	3·3	24,240
		II 2-c ..	3·3	25,680
	Newman	3 ..	2·8	23,400
		4 ..	1·8	12,780
	Little Rallia	3 ..	1·7	15,150
			70·4	359,850
1950–51 ..	.. Aramby	II 2 ..	8·4	24,100
		VII 4-b ..	2·8	24,960
		III 3 ..	3·5	17,700
	Cairnhill	I 4-a 4 ..	6·5	54,600
	Coonoor Peak	I 38 ..	4·7	27,000
		I 6 ..	5·3	28,800
	Blackbridge	4 ..	9·8	28,800
	Rallia	10 ..	1·8	22,050
		13-a ..	7·0	39,960
			44·8	267,970

Abstract—Yield of bluegum fuel obtained from the entire division during the period 1938–39 to 1950–51.

Year.	*Acreage.*	*Yield in lots of 120 cubic feet.*	*Average yield per acre in lots (1 lot 120 cubic feet).*
1938–39	68·7	2,815	40
1939–40	50·5	2,409	48
1940–41	71·3	3,310	47
1941–42	82·7	3,229	39
1942–43	78·6	3,335	42
1943–44	106·6	7,015	66
1944–45	167·8	10,185	57
1945–46	37·4	2,273	62
1946–47	100·8	8,318	83
1947–48	81·3	4,480	55
1948–49	76·9	3,490	47
1949–50	70·4	2,999	43
1950–51	44·8	2,233	50
	1,037·8	56,091	54

(*c*) *Wattle.*

Year.	*Name of the locality.*	*Acreage.*	*Outturn.*		
			Bark in tons.	*Fuel in cubic feet.*	
1948–49 ..	.. Blackheath	2·4	12	10,185	
1949–50 ..	.. Blackheath	1·8	2	4,200	
	Huppathi	3·5	20	7,200	
		5·3	22	11,400	
950–51 ..	.. Lovedale	3·80	12	1,800	
	Do.	6·25	25	3,900	
	Marliamund	2·50	12	2,880	
	Cairnhill	2·75	11	4,560	
	Kothiben	1·50	11	1,920	
	Kokothorai	6·15	37	8,160	
	Do.	10·00	21	4,560	
	Gudakalahalla I	17·50	58	3,600	plus 138½ bags of charcoal of 42 lb. a bag.
	Do. II	3·25	15	6,720	
	Sullicode	5·50	16	8,400	
	Kokothorai	5·00	6	3,120	
		64·20	224	49,620	

(c) *Wattle*—cont.

Year.	*Name of the locality.*	*Acreage.*	*Outturn.* Bark in tons.	*Outturn.* Fuel in cubic feet.
1951–52	Kokothorai	25·00	88	9,600
	Araihatti	3·25	12	6,160
	Karpakam I	5·00	17	8,400
	Do. II	5·00	15	6,240
	Do. III	5·00	3	1,680
	Aramby	1·25	6	3,480
	Yedakad I	1·50	3	1,920
	Do. II	11·75	4	4,440
	Kokothorai	21·75	68	6,360
	Sim's Park	1·25	½	240
	Gudakalahalla III	6·75	3½	960
	Mokkai	2·00	10	960
	Pillurshola	5·50	19	6,360
	Kothiben	10·75	23	2,160
	Sullicode IV	7·50	12	2,400
	Curzon Valley I	6·00	6	1,320
	Do. II	25·00	5	2,400
	Kannerahodai	5·00	21	10,080
		149·25	316	75,160

Abstract—Yield of wattle bark and wattle fuel from the entire division from 1948–49 to 1951–52.

Year.	*Acreage.*	*Yield of bark in tons.*	*Yield of fuel in lots of 120 cubic feet.*	*Average yield of bark per acre in tons.*	*Average yield of fuel in lots of 120 cubic feet.*
1948–49	2·4	12	85	5	35
1949–50	5·3	22	95	4	18
1950–51	64·2	224	414	3	7
1951–52	149·3	316	626	2	4
	221·2	574	1,220	2·5	6·5

Statement of yield of sandalwood in the Nilgiris Division from 1930–31 to 1951–52.

Year.	Coonoor range. T.	CWT.	QRS.	LB.	Sigur range. T.	CWT.	QRS.	LB.	Total yield. T.	CWT.	QRS.	LB.
1930–31	1	13	1	22	22	11	1	24	24	4	3	18
1931–32	1	18	2	27	18	7	2	26	20	6	1	25
1932–33	0	6	1	10	13	11	1	9	13	17	2	19
1933–34	0	10	0	6	18	5	3	26	18	16	0	4
1934–35	3	7	3	14	32	6	0	15	35	14	0	1
1935–36	0	15	1	20	54	16	0	12	55	11	2	4
1936–37	0	6	1	10	85	19	1	8	86	5	2	18
1937–38	0	13	3	9	55	16	2	19	56	10	2	0
1938–39	7	15	0	24	65	8	2	19	73	3	3	5
1939–40	13	14	0	5	17	19	0	5	31	13	0	10
1940–41	3	18	1	6	38	12	0	14	42	10	1	20
1941–42	1	3	3	15	36	14	0	16	38	18	0	3
1942–43	3	0	9	5	16	3	3	15	19	6	0	20
1943–44	16	12	1	26	9	9	3	10	26	2	1	8
1944–45	2	16	0	24	23	9	2	2	26	5	2	26
1945–46	5	5	0	4	10	13	3	10	15	18	3	14
1946–47	0	13	3	4	13	14	2	23	14	8	1	27
1947–48	3	1	3	20	17	4	1	13	20	6	1	5
1948–49	8	10	3	22	38	6	2	15	46	17	2	9
1949–50	25	5	1	13	40	6	1	4	65	11	2	17
1950–51	6	7	2	0	50	18	0	22	57	5	2	22
1951–52	19	15	2	7	28	3	2	26	47	19	1	5

Statement of yield of bamboos in the Nilgiris Division.

Year.	Number of bamboos. Hulikal series.	Vagappanai series.	Total.
1939–40	10,560	11,220	21,780
1942–43	9,581	7,970	17,551
1943–44 to 1948–49	Details not available.		
1949–50	6,115	13,903	20,018
1950–51	6,770	6,846	13,616

Section 5—Past revenue and expenditure.

281 The following statements give particulars of revenue and expenditure from the year 1937–38 to 1951–52 :—

Revenue.

Year.	Removal of produce by Government agency.				
	Timber.	*Firewood and charcoal.*	*Bamboos.*	*Sandalwood.*	*Other produce.*
(1)	(2)	(3)	(4)	(5)	(6)
	RS.	RS.	RS.	RS.	RS.
1937–38	33,380	30,624	..	31,542	842
1938–39	30,598	10,532	24	37,389	612
1939–40	41,355	4,170	..	20,647	929
1940–41	28,841	10,235	..	25,424	2,553
1941–42	41,134	3,901	..	41	23,055
1942–43	25,204	16,235	..	29,109	4,924
1943–44	34,350	14,604	..	34,015	2,478
1944–45	50,342	5,783	..	53,862	2,481
1945–46	16,962	6,719	..	34,150	331
1946–47	1,926	3,535	..	58,776	3,779
1947–48	1,207	1,548	..	28,371	2,448
1948–49	1,83,659	11,648	..	6,505	42,362
1949–50	1,03,468	3,869	..	2,47,315	3,487
1950–51	4,85,454	161	31	1,99,962	1,865
1951–52	6,64,182	130	31	1,25,499	251

Year.	Removal of produce by consumers and purchasers.				
	Timber.	*Firewood and charcoal.*	*Bamboos.*	*Grazing and fodder grass.*	*Other produce.*
	(7)	(8)	(9)	(10)	(11)
	RS.	RS.	RS.	RS.	RS.
1937–38	875	4,978	1,709	6,412	3,852
1938–39	1,411	20,666	1,718	3,624	3,669
1939–40	538	19,115	1,039	3,309	538
1940–41	162	4,178	192	3,344	2,953
1941–42	616	25,547	119	3,460	3,211
1942–43	1,186	41,431	177	3,235	4,880
1943–44	2,767	60,988	195	3,061	5,412
1944–45	6,719	67,406	180	3,040	4,932
1945–46	9,906	50,363	402	3,012	17,015
1946–47	11,439	49,998	1,100	3,254	28,545
1947–48	8,427	37,931	476	2,805	14,992
1948–49	7,670	88,394	291	3,105	35,399
1949–50	10,816	82,547	403	3,233	57,665
1950–51	4,424	72,703	1,877	3,263	1,08,290
1951–52	22,061	1,14,264	2,824	2,975	1,16,173

Year.	Miscellaneous.			Total of items Nos. 2 to 14.	Deduct refunded.	Net revenue.
	Fines and forfeitures.	*Rents of building.*	*Other sources.*			
	(12)	(13)	(14)	(15)	(16)	(17)
	RS.	RS.	RS.	RS.	RS.	RS.
1937–38	147	1,156	13,243	1,29,961	151	1,29,810
1938–39	122	1,193	13,938	1,25,772	126	1,25,646
1939–40	43	1,146	14,173	90,001	173	1,10,463
1940–41	115	1,142	11,814	1,11,243	218	1,11,025
1941–42	16	1,539	15,037	96,946	238	96,708
1942–43	56	1,140	11,606	1,39,183	495	1,38,688
1943–44	377	1,207	17,762	1,77,216	862	1,76,354
1944–45	273	1,012	19,315	2,15,345	1,553	2,13,792
1945–46	877	916	21,143	1,61,796	1,705	1,60,091
1946–47	105	996	25,071	1,88,424	917	1,87,507
1947–48	111	1,800	22,427	1,22,543	372	1,22,171
1948–49	2,240	2,228	45,632	4,29,113	465	4,28,648
1949–50	2,632	1,874	66,542	5,83,861	306	5,83,555
1950–51	1,184	1,484	1,00,694	9,81,492	400	9,81,092
1951–52	1,905	1,735	99,513	11,51,543	575	11,50,968

NOTE.—The revenue realized by the sale of sandalwood of the Nilgiris Division sold at Satyamangalam (Coimbatore North Division) had been incorporated in this statement.

Expenditure.

Year.	Conservancy and works. — Exploitation by Government Agency. — Timber.	Firewood and charcoal.	Bamboos.	Sandalwood.	Grass and other produce.	Produce removed by purchasers and consumers.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	RS.	RS.	RS.	RS.	RS.	RS.
1937–38	4,076	10,426	26	4,622	599	657
1938–39	6,678	3,983	5	4,475	474	644
1939–40	9,047	4,480	..	2,325	701	661
1940–41	4,439	4,041	..	3,257	1,828	657
1941–42	2,605	4,413	..	2,865	844	625
1942–43	19,490	5,578	..	2,315	1,104	833
1943–44	4,999	2,124	..	4,239	966	999
1944–45	4,786	3,161	..	3,493	641	1,024
1945–46	746	1,815	..	..	646	1,961
1946–47	1,501	1,643	..	2,393	458	2,317
1947–48	7,389	750	..	3,111	686	1,395
1948–49	9,287	7,401	36	4,602	185	3,223
1949–50	45,358	468	..	9,465	497	1,582
1950–51	93,056	221	..	10,576	290	7,703
1951–52	1,10,058	327	..	7,672	388	7,639

Year.	Conservancy and works—cont. — Feed and upkeep of cattle.	Renewals and replacement.	Buildings and communications. — Road and bridges.	Buildings.	Other works.	Rates and taxes.
	(8)	(9)	(10)	(11)	(12)	(13)
	RS.	RS.	RS.	RS.	RS.	RS.
1937–38	10,801	685	3,388	4,119	82	626
1938–39	10,624	907	3,282	3,382	67	591
1939–40	18,868	491	2,648	3,428	318	754
1940–41	17,002	1,046	2,284	2,580	179	721
1941–42	22,469	983	2,879	2,835	32	688
1942–43	19,280	937	4,420	2,719	289	929
1943–44	13,582	914	5,550	3,635	104	780
1944–45	3,347	788	4,986	2,946	1,055	688
1945–46	1,803	423	3,803	8,035	1,269	662
1946–47	2,933	680	4,054	9,024	207	824
1947–48	11,496	1,638	7,698	15,030	266	727
1948–49	20,530	550	3,687	5,728	565	1,359
1949–50	25,320	1,120	4,507	7,595	1,490	1,454
1950–51	37,551	1,522	1,659	3,146	1,584	139
1951–52	48,899	5,357	6,603	7,268	2,743	2,795

Year.	Conservancy and works—cont. — Regeneration and conservation of forests. — Regeneration.	Fire protection.	Other works.	Other Miscellaneous charges.	Establishment. — Pay.	Allowances.	Contingencies.	Total.
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)
	RS.	RS.	RS.	RS.	RS.	RS.	RS.	RS.
1937–38	2,559	2,514	1,021	8,616	66,500	13,893	2,511	1,38,121
1938–39	2,946	2,486	1,031	8,137	70,192	14,379	2,247	1,36,530
1939–40	4,894	2,621	859	6,782	57,872	13,567	2,194	1,32,511
1940–41	5,063	2,872	1,297	6,758	57,764	13,808	2,146	1,27,742
1941–42	6,716	2,503	1,073	8,779	55,332	12,255	1,815	1,29,711
1942–43	32,640	2,792	1,140	6,986	52,681	16,326	1,966	1,71,589
1943–44	2,20,142	3,443	1,398	8,303	63,015	27,525	2,084	3,63,802
1944–45	12,711	3,976	1,874	9,423	53,517	31,126	1,838	1,41,660
1945–46	13,319	3,667	2,690	10,102	51,687	42,265	2,506	1,27,289
1946–47	14,019	5,332	2,138	12,634	66,742	47,824	2,645	1,78,368
1947–48	12,801	4,596	1,775	12,465	52,521	53,424	2,341	2,20,809
1948–49	57,573	2,935	1,723	10,016	67,180	66,990	2,381	2,85,801
1949–50	34,187	3,613	1,638	9,193	80,973	61,785	2,777	2,96,522
1950–51	42,237	4,009	1,636	10,294	63,320	53,849	2,685	3,40,977
1951–52	66,505	3,850	3,547	11,041	66,561	55,282	2,929	4,19,564

Abstract of Revenue and Expenditure of the Nilgiris Division from 1937–38 to 1951–52.

Year.	Revenue.	Expenditure.		Total of Items (3) and (4).	Surplus.	Deficit.
		Conservancy and works.	Establishment.			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
	RS.	RS.	RS.	RS.	RS.	RS.
1937–38	1,29,810	55,217	82,904	1,38,121	..	8,311
1938–39	1,25,646	49,712	86,818	1,36,530	..	10,884
1939–40	1,10,463	58,878	73,633	1,32,511	..	22,048
1940–41	1,11,025	73,718	54,024	1,27,742	..	16,717
1941–42	96,709	60,309	69,402	1,29,711	..	33,003
1942–43	1,38,688	1,01,616	70,973	1,71,589	..	32,901
1943–44	1,76,354	2,71,178	92,624	3,63,802	..	1,87,448
1944–45	2,13,792	55,079	86,581	1,41,660	73,120	..
1945–46	1,60,091	50,841	76,448	1,27,289	32,802	..
1946–47	1,87,507	60,157	1,18,211	1,78,348	9,139	..
1947–48	1,22,171	83,523	1,37,286	2,20,809	..	98,638
1948–49	4,28,648	1,29,400	1,56,401	2,85,801	1,42,847	..
1949–50	5,83,555	1,50,987	1,45,535	2,96,522	2,87,633	..
1950–51	9,81,092	2,21,123	1,19,854	3,40,977	6,40,115	..
1951–52	11,50,968	2,84,792	1,24,772	4,19,564	7,31,404	..

CHAPTER VI.

Statistics of Growth and Yield.

Section 1—Statistics relating to Bluegum (Eucalyptus Globulus).

282. *Rate of growth in height and girth of dominant trees of Eucalyptus Globulus (Bluegum) in plantations of the Nilgiris classified into three quality classes.*—The following table furnishes the averages of the height of dominant trees and their corresponding girths at breast height for the various age gradations of bluegum plantations in the Nilgiris, classified into three quality classes :—

Age in years.	First quality.		Second quality.		Third quality.	
	Average height of the dominant trees in feet.	Average girth of the dominant trees in inches at breast height.	Average height of the dominant trees in feet.	Average girth of the dominant trees in inches at breast height.	Average height of the dominant trees in feet.	Average girth of the dominant trees in inches at breast height.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3	53	19	33	14	17	9
4	64	22	43	17	27	12
5	72	26	53	19	37	15
6	80	29	60	22	42	17
7	86	32	66	24	48	19
8	92	34	72	27	53	21
9	97	37	78	29	58	23
10	103	39	82	31	62	25
11	108	41	87	33	66	27
12	112	44	91	35	70	28
13	116	46	95	37	73	29
14	121	48	98	38	77	30
15	124	49	102	40	80	32
16	127	51	105	42	83	33
17	130	53	109	44	86	34
18	133	54	112	45	88	35
19	135	56	114	47	90	36
20	137	57	116	48	92	37

283. *Outturn Tables for Bluegum Fuel according to quality.*—The following statement gives the average outturn per acre in stacked cubic feet of bluegum firewood that may be obtained from normal plantations of different age gradations and quality classes :—

Average outturn per acre in stacked cubic feet.

Age in years. (1)	First quality. (2)	Second quality. (3)	Third quality. (4)
5	3,550	2,600	1,650
6	4,425	3,225	2,025
7	5,200	3,800	2,400
8	6,000	4,375	2,750
9	6,775	4,925	3,100
10	7,525	5,475	3,450
11	8,225	6,000	3,800
12	8,825	6,475	4,125
13	9,400	6,950	4,400
14	9,925	7,350	4,750
15	10,400	7,700	5,000
16	10,850	8,050	5,250
17	11,300	8,400	5,500
18	11,725	8,750	5,750
19	12,125	9,025	5,975
20	12,525	9,375	6,225

284. *Increment figures for bluegum in terms of outturn.*—The statement given below shows the current annual increment and mean annual increment corresponding to each age calculated from the outturn data furnished in the statement given under paragraph 283 :—

Age in years.	*First quality.*		*Second quality.*		*Third quality.*	
	C.A.I.	*M.A.I.*	*C.A.I.*	*M.A.I.*	*C.A.I.*	*M.A.I.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
6	..	737·5	..	537·5	..	337·5
7	775	742·8	575	542·8	375	342·8
8	800	750·0	575	546·8	350	343·7
9	775	752·8	550	547·2	350	344·4
10	750	752·5	550	547·5	350	345·0
11	700	747·7	525	546·3	350	345·4
12	600	735·4	475	539·6	325	343·7
13	575	723·1	475	534·6	325	342·3
14	525	708·9	400	525·0	300	339·3
15	525	693·3	350	513·3	250	333·3
16	450	678·1	350	503·1	250	328·1
17	450	664·2	350	494·1	250	323·5
18	425	651·4	350	486·1	250	319·4
19	400	637·9	275	475·0	225	314·4
20	400	626·2	356	468·7	250	311·2

285. It will be observed from the increment figures that the M.A.I. in respect of outturn culminates in the case of the first quality just before the commencement of the tenth year, while in the case of the second quality just after the completion of the tenth year, and in the case of the third quality just after the completion of the eleventh year. It is therefore, clear that from the point of view of outturn of fuel, the age at which the rate of volume production is maximum can in no case exceed twelve years in the case of the bluegum plantations of the Nilgiris.

286. *Assessment of quality of the Bluegum Stands.*—The average height of the dominant trees in a locality is one of the good indicators of the potential quality of the site. Hence for the assessment of the quality class of the bluegum plantations, not less than six dominant trees well distributed over each compartment were measured, and the average height of the dominant trees for the compartment obtained. Using the tabular statement given in paragraph 282, the average quality of the site was determined. The quality thus determined at the time of the compilation of this plan (1952) in respect of each plantation is given in the felling series statements in Chapter II of Part II (Vide paragraph 345) as well as in the compartment histories. It may be pointed out, that, while the height of the dominant trees in a locality is an index of the potential quality of the site, the outturn that may be expected corresponding to that quality and age of the plantation will not necessarily always be the same as indicated in the Outturn Tables given in paragraph 283, because the actual outturn at a site is the resultant of various factors at play like the failure of certain stools to send up coppice shoots, failure to achieve complete stocking in the early stages of the plantations, wind and frost damage, illicit removals, failure of the stand to receive normal treatment due to climatic and biotic factors. Further many a plantation which shows good promise of developing into one of first quality in the early stages of its life, is

found to taper off to a lower quality after the first flush of youth. Hence to make a reliable forecast of the actual outturn it is better to assess the quality of the stand prior to the sale (at the time of survey of the compartment put up for sale) and read the probable outturn from the table ; proportionate deduction may have to be made in case the crop had failed in patches. Further, the quality of the site assessed at the close of the rotation by the measurement of the dominant trees of the final crops is a more reliable indicator of the potential capacity of the site.

287. An analysis of the assessment of the quality classes of the different bluegum areas indicates that out of the total area of 2,493 acres included in the Bluegum Working Circle, 153 acres fall under the first quality, 1,184 acres under the second quality and 1,156 acres under the third quality. Hence only 62 per cent of the bluegum plantations fall under the first quality ; 47·3 per cent of them are of the second quality and in 46·5 per cent of the third quality. First quality areas occur scattered in Governorshola, Muthinad, Snowdon, Cairnhill and Coonoor Peak Felling Series.

288. The following statement gives the distribution of the quality classes in respect of bluegum for areas included in the Bluegum Working Circle :—

Number and name of the felling series.	Total area of the series in acres.	Area under first quality in acres.	Area under second quality in acres.	Area under third quality in acres.
(1)	(2)	(3)	(4)	(5)
1 Aramby	288·10	..	7·07	283·03
2 Doddabetta	275·52	..	171·95	103·57
3 Glenmorgan	225·00	..	225·00	..
4 Governorshola	273·82	29·60	114·82	129·40
5 Muthinad	130·83	6·95	59·03	71·65
6 Snowdon	188·30	50·10	77·50	60·70
7 Cairnhill	268·80	45·31	135·46	88·03
8 Ketti	94·40	..	89·60	4·80
9 Bandyshola	197·14	..	149·06	48·08
10 Black Bridge	172·37	..	..	172·37
11 Coonoor Peak	228·74	17·55	113·07	98·12
12 Rallia	150·01	3·50	41·08	105·43
Total ..	2,493·03	153·01	1,183·64	1,156·38

289. *Statement of averages of height and girth of the 'mean' trees measured in the bluegum plantations of the various quality classes.*—The heights and girths at breast height of the 'mean' trees in the stands of the various bluegum plantations of the Nilgiris were measured and the averages obtained for each quality class are furnished in the tabular statement given below. While the measurement of the dominant trees help to ascertain the quality of the site, the following statement would give an indication of the average size of the 'mean' tree in the stand for each age and quality :—

Age in years.	First quality.		Second quality.		Third quality.	
	Average height of the mean tree in feet.	Average girth at breast height of the mean tree in inches.	Average height of the mean tree in feet.	Average girth at breast height of the mean tree in inches.	Average height of the mean tree in feet.	Average girth at breast height of the mean tree in inches.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
3	22	12	16	9	10	6
4	28	14	20	11	13	8
5	33	16	25	13	16	9
6	38	18	29	14	19	10
7	43	20	32	16	22	12
8	47	21	36	17	25	13
9	50	23	38	18	28	14
10	53	24	42	20	31	15
11	56	25	45	21	33	16
12	59	26	47	22	35	17
13	62	27	49	22·5	36	18
14	65	28	51	23	38	18·5
15	67	29	53	24	40	19
16	70	30	54	25	41	20
17	72	31	56	26	42	21
18	74	32	58	26·5	43	21·5
19	76	33	59	27	45	22
20	78	34	60	27·5	46	22·5

290. *Deterioration of production in successive rotations in bluegum plantations.*—Though there is no evidence to show that there is any definite tendency for the quality of the site to fall off with successive rotations in the bluegum plantation areas, there is evidence to show that there is an appreciable and progressive fall in the outturn of firewood from the same bluegum plantation at successive fellings. The reason for the fall in production is primarily the failure of a proportion of the felled trees to throw up coppice shoots. Possibly there is also a reduction in the vigour of coppice stools with successive fellings. An attempt made, at the time of the preparation of the last working plan, to estimate quantitatively the loss in production at successive fellings indicated there, there is a fall of 9 per cent in production in the third rotation and 20 per cent in the fourth rotation.

291. *Miscellaneous facts relating to blue gum*—(*a*) *Bark.*—The following table gives bark thickness for trees of different sizes :—

Girth over bark at breast height in inches.	Average thickness of bark in inches.	Average allowance for bark in girth measurements in inches.	Proportional volume of bark to whole stem expressed as percentage.
(1)	(2)	(3)	(4)
Below 6	0·10	0·6	36·0
6 to 11	0·25	1·6	32·4
12 to 23	0·40	2·5	25·8
24 to 35	0·60	3·8	23·7
36 to 47	0·80	5·0	22·4
48 to 59	0·90	5·7	20·0

(*b*) *Weight.*—A freshly stacked lot of 8 feet × 5 feet × 3 feet may weigh as much as 4,800 lb. By the time it is suitable for burning the average weight of the stock would be about 4,000 lb. The dryage by weight would therefore be about 17 per cent.

(*c*) *Stacked volume.*—The billeted firewood in the bluegum areas are stacked into "lots". The measurement of the standard stack or 'lot' is 8 feet by 5 feet by 3 feet. A freshly stacked lot measures 120 stacked cubic feet and weighs about 1¾ tons. The reducing factor for converting stacked volume into solid will be 0·625.

(*d*) *Results of timber tests on bluegum.*—The following statement gives figures of the results of timber tests carried out on bluegum and comparative figures for teak are also included :—

Nature of the test.	Bluegum.	Teak.
1 Specific gravity	0·676	0·598
2 Moisture content per cent	52·4	51·8
3 Weight in lb. per cubic foot	64	57
4 Static bending—		
Fibre stress at elastic limit lb. per square inch	6,540	7,090
Modulus of rupture lb. per square inch	11,275	11,435
Modulus of elasticity in 1,000 lb. per square inch	2,110	1,673
Work to elastic limit lb. per cubic inch	1·17	1·70
5 Impact bending—		
Fibre stress at elastic limit lb. per square inch	17,715	16,745
Maximum drop in inches	41	35
Modulus of elasticity in 1,000 lb. per square inch	2,422	2,183
Work to elastic limit lb. per cubic inch	7·23	7·23
6 Compression parallel to grain—		
Fire stress at elastic limit lb. per square inch	3,230	4,075
Maximum crushing strength lb. per square inch	5,110	5,870
Modulus of elasticity 1,000 lb. per square inch	3,223	1,937
7 Compression perpendicular to grain—		
Fibre stress at elastic limit lb. per square inch	840	1,055
8 Hardness—		
Radial lb. load	1,255	1,045
Tangential lb. load	1,195	1,030
End lb. load	1,325	915
9 Shear—		
Radial lb. load	1,245	1,045
Tangential lb. load	1,425	1,170
10 Tension		
Radial lb. load	600	525
Tangetial lb. load	940	695

Section 2—Statistics relating to Black Wattle (Acacia mollissima)

292. *Rate of growth in height and in girth as well as the yield of bark per acre of Acacia mollissima plantations in the Nilgiris.*—The following tentative yield table prepared by M. S. Raghavan for the black wattle plantations in the Nilgiris gives figures from such data available in the Silviculturist's division.

Age in years.	*First quality.* 200 *trees per acre—average espacement* 15 *feet.*			*Second quality.* 250 *trees per acre—average espacement* 13 *feet.*			*Third quality.* 300 *trees per acre—average espacement* 12 *feet.*		
	D.B.H. in inches.	*Height in feet.*	*Dry bark per acre in tons.*	*D.B.H. in inches.*	*Height in feet.*	*Dry bark per acre in tons.*	*D.B.H. in inches.*	*Height in feet.*	*Dry bark per acre in tons.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1 ..	0·9	10	0·4	0·5	8	0·2	0·3	6	0·1
2 ..	2·3	26	1·3	1·8	20	0·9	1·2	13	0·5
3 ..	4·0	41	2·9	3·2	32	1·8	2·5	24	1·0
4 ..	5·5	51	4·1	4·6	42	2·9	3·8	33	1·8
5 ..	7·0	59	5·2	5·7	50	4·0	4·8	41	2·7
6 ..	7·9	64	6·1	6·5	55	4·7	5·4	46	3·4
7 ..	8·5	68	6·7	7·1	58	5·2	5·8	48	3·8
8 ..	9·0	70	7·0	7·5	60	5·8	6·0	50	4·0

293. The majority of the wattle plantations in the Nilgiris would be either of the second or the third quality with reference to the yield table given in the preceding paragraph. It is hoped that as more experience is gained in the technique of formation and maintenance of wattle areas it would be possible to improve the quality of many areas.

294. *Increment figures for yield of dry bark in tons per acre from black wattle plantations.*—The statement given below shows the current annual increment and mean annual increment of the yield of dry bark in tons per acre corresponding to each age from the outturn data given in the yield table furnished in paragraph 292.

Age in years.	*First quality.* 200 *stems per acre—average espacement* 15 *feet.*		*Second quality.* 250 *trees per acre—average espacement.* 13 *feet.*		*Third quality.* 300 *trees per acre—average espacement.* 12 *feet.*	
	C.A.I.	*M.A.I.*	*C.A.I.*	*M.A.I.*	*C.A.I.*	*M.A.I.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1	..	0·40	..	0·20	..	0·10
2	0·9	0·65	0·7	0·45	0·4	0·25
3	1·6	0·97	0·9	0·60	0·5	0·33
4	1·2	1·03	1·1	0·72	0·8	0·45
5	1·1	1·04	1·1	0·80	0·9	0·54
6	0·9	1·02	0·7	0·79	0·7	0·57
7	0·6	0·96	0·5	0·74	0·4	0·54
8	0·3	0·88	0·6	0·73	0·2	0·50

It will be noticed that the M.A.I. in respect of outturn of bark, culminates on an average between the fifth and the sixth year.

295. *Tannin and soluble non-tannin content of the black wattle bark of different origins.*—The results of the analysis of tannin and soluble non-tannin contents of black wattle bark of various sources are furnished below :—

Name of the place.	Tannin content per cent.	Non-Tannin content per cent.
South India—		
1 Prospect Estate	39·6	13·0
2 Parry's Estate	43·3	11·9
3 Thiashola Estate	34·8	8·6
4 Baikee	28·5	5·0
5 Thayar Tea Estate	31·8	14·0
6 Madras (1925)	43·6	10·9
7 Sillahalla Estate	42·5	11·3
8 Travancore	39·8	8·9
9 Kodaikanal	34·5	12·7
South Africa—	34 to 39	10·5 to 11·5

296. *Variations of Tannin content in the bark of black wattle trees.*—The percentage of tannin in black wattle bark is influenced by a great variety of factors of which only some are controlable by silvicultural means, but many are correlated with environment. The tannin content of trees may also exhibit considerable variation of a genetic nature. Hooper (1902) took samples of bark in trees near Doddabetta and found that the lower bole bark of the wattle trees was richest in tannin content with 33·4 per cent while the upper bole bark contained 25·4 per cent and the bark from branches contained 14·7 per cent. Investigations in Australia and South Africa show that thick bark contains more tannin than thin bark. Tannin content recently analysed from the barks obtained from the various age gradation of wattle plantations in the Nilgiris revealed that there is a gradual fall in the tannin content after the sixth year.

297. *Miscellaneous data relating to black wattle—(a) Results of the analysis on destructive distillation of the Nilgiris wattle wood.*—The wattle wood on burning usually yield a fair amount of good charcoal. On destructive distillation of the Nilgiri wattle wood it was found that it yields the following :—

	PER CENT.		PER CENT.		PER CENT.
Moisture	7·7	Methyl alcohol.	1·21	Charcoal ..	29·5
Acetic acid ..	5·13	Tar (settled) ..	9		

(*b*) *Seeds and germination.*—*Acacia Mollissima* seeds give a germinative capacity of 57 per cent and a plant per cent of 15. The number of seeds per lb. is 28,560 (1,785 per oz.) and usually about 4,000 plants may be expected from the sowing of a pound of seeds.

(*c*) *Yield of wood from black wattle plantations.*—The yield of wattle wood from the plantations of the Nilgiris varies from 15 to 40 tons per acre for a rotation of ten years. On an average about 25 tons of wood may be expected when the plantation is felled at the end of ten years.

Section 3—Statistics relating to Pyrethrum (Crysanthamum cinnerarifolium).

298. As a result of the classic researches of Standinger and Ruzika two active principles, viz., Pyrethrin I (C 21 H30 O3) and Pyrethrin II (C22 H30 O3) were isolated from Pyrethrum extracts. The ratio of Pyrethrin I to Pyrethrin II in the flower varies between 1 : 0·65 to 1 : 2·42. Pyrethrin I is slightly more active than Pyrethrin II as it kills roaches in 1 : 10,000 solution in 10 to 20 minutes, while the latter takes 20 to 40 minutes at the same dilution. Pyrethrins are highly unsaturated both in the acid and alcohol part of the molecule and therefore unstable. Their toxicity has been found to depend not only on their composition but on the spatial arrangement of the molecules.

299. *Distribution of Pyrethrins in the different parts of the Pyrethrum flowers.*—Gradinger and Coral ascertained the distribution of Pyrethrins in the different parts of the Pyrethrum flowers to be as follows :—

Name of the part of the flower.	Composition of flower by weight. PER CENT.	Pyrethrins per cent.	Percentage of the total pyrethrins in the flower.
Achenes	34·2	2·27	92·4
Receptacles	11·3	0·26	3·5
Involucral Bracts	11·5	0·15	2·0
Disk florets	25·8	Traces.	Traces.
Ray florets	17·2	Traces.	Traces.

300. The most important factors affecting the pyrethrum content of the flowers are their degree of maturity when picked and the length of time between harvesting and assaying. The pyrethrum content rises to the maximum at the maturity of the flowers. After pollination although the quantity of pyrethrins per flower head remains the same, the development of achenes is so great that the percentage of pyrethrins per flower head drops. The correct stage for picking the flowers is when two-third of disk florets are fully open.

301. *Loss of Pyrethrin content with storage.*—When freshly ground Pyrethrum flowers are stored for one year, it is found that a loss of 30 per cent to 44 per cent in pyrethrin content occurs according to mode of storage ; when stored in metal drums or double gunny or tin cans the loss varies from 30 to 33 per cent, whereas when stored in unlined single gunny or open trays the loss ranges from 39 to 44 per cent. On an average it may be taken that a loss of about 36 per cent occurs on storing for one year freshly ground flowers. The loss is 22 per cent for a period of six months, 13 per cent for a period of three months, 9 per cent for a period of two months and 8 per cent for a period of one month. Hence, proper storage either in metal drums or double gunny and quick disposal of the dried flowers for extraction of pyrethrum are indicated.

302. *Yield of pyrethrum flowers.*—The statement given below shows the average yield per acre obtained from the various plantations raised in the Nilgiris:—

Year.	Area in acres.	Yield of flowers in lb.		Yield per acre in lb.	
		Fresh.	Dry.	Fresh.	Dry.
1943–44	1,400	1,038	..	..	..
1944–45	1,400	441,475	107,912	316	77
1945–46	1,800	377,654	96,561	210	54
1946–47	1,800	356,974	89,129	198	50
1947–48	948	120,433	31,113	127	33
1948–49	660	25,640	6,244	39	10

It will be seen from the above statement that the loss in dryage is nearly 75 per cent, i.e., four pounds of fresh flowers on drying would yield about one pound of dry flowers.

303. *Analysis of Pyrethrum flowers grown in the Nilgiris.*—Analysis of flowers grown in the Nilgiris was carried out by Dr. T. W. West of London and he found that on an average the total pyrethrin content was 1·35 per cent, the extent of Pyrethrin I being 0·77 per cent and of Pyrethrin II 0·68 per cent.

304. *Yield of Pyrethrum flowers with the passage of years.*—Research experiments conducted at Nanjanad show that there is a definite and marked falling off of the yield in the fourth year as indicated by the following figures :—

Yield of fresh flowers in lb. and oz. per acre.

	LB.	OZ.
Average yield in the first year	18	8
Average yield in the second year	596	5
Average yield in the third year	1,222	0
Average yield in the fourth year	212	0

Section 4—Statistics relating to teak in Mudumalai Range.

305. *Rate of growth of plantation teak in Mudumalai range.*—The following statement showing the heights and girths corresponding to various ages is based on the measurements made in Mudumalai range teak plantations. Most of the teak plantations conform to the fourth quality of All-India Teak Yield Tables and some are even of the fifth quality. Rarely small patches of the third quality are available:—

Age in years.	Average height of the dominant trees in feet.	Their corresponding girth breast height in inches.	Age in years.	Average height of the dominant trees in feet.	Their corresponding girth in inches.
1	6·0	2·0	19	47·0	29·5
2	9·5	4·0	20	49·0	30·5
3	13·0	6·0	21	51·0	31·5
4	15·5	8·0	22	52·5	32·3
5	18·0	10·0	23	54·0	33·3
6	21·0	12·0	24	55·5	34·0
7	24·0	14·0	25	56·5	34·8
8	26·0	15·5	26	58·0	35·5
9	28·5	17·0	27	59·5	36·3
10	31·0	18·5	28	60·5	37·0
11	33·0	20·0	29	62·0	38·0
12	35·0	21·3	30	63·0	38·8
13	37·0	22·5	31	64·5	39·5
14	39·0	23·8	32	66·0	40·3
15	40·5	25·0	33	67·0	41·0
16	42·0	26·0	34	68·5	41·5
17	44·0	27·0	35	70·0	42·3
18	45·5	28·3			

306. *Rate of growth of natural teak in girth.*—The following statement showing the relationship between age and girth in the case of naturally occurring teak trees in Mudumalai range is based on ring countings of teak stumps in the selection felling coupe of Mudumalai ranges :—

Age in years.	Girth over bark in inches one foot from the ground level.	Age in years.	Girth over bark in inches one foot from the ground level.	Age in years.	Girth over bark in inches one foot from the ground level.
10	10	60	46	110	67
20	17	70	52	120	71
30	25	80	56	130	74
40	33	90	60	140	76
50	40	100	64		

Section 5—Statistics relating to sandalwood.

307. *Outturn table for the Sandalwood of the Nilgiris.*—The following statement showing the outturn of Sandalwood against each inch class of girth is based on the averages of actual outturn of rough cleaned wood obtained in the division from the various girth classes of sandalwood trees extracted in the past :—

Girth in inches.	Outturn in lb. of rough cleaned wood.	Girth in inches.	Outturn in lb. of rough cleaned wood.	Girth in inches.	Outturn in lb. of rough cleaned wood.
5	3	20	64	35	217
6	4	21	72	36	230
7	5	22	80	37	244
8	6	23	88	38	258
9	8	24	96	39	271
10	10	25	105	40	284
11	13	26	114	41	298
12	16	27	124	42	311
13	20	28	134	43	323
14	24	29	145	44	336
15	29	30	156	45	350
16	35	31	167	46	364
17	42	32	179	47	377
18	49	33	191	48	391
19	56	34	204		

Section 6—Statistics relating to bamboos.

308. Enumerations were made in the principal sandal areas of the outer eastern slopes of the Nilgiris (Coonoor Range). The results given below have been computed on the enumeration data from a 10 per cent stratified systematic sampling :—

Name of the coupe.	Area in acres.	Effective in acres.	Total number of bamboos clumps.
Hullikal I	768	225	5,614
Hullikal II	371	155	5,425
Hullikal III	1,164	250	6,401
Vagapanai I	1,201	282	19,375
Vagapanai II	827	334	33,156
Vagapanai III	1,091	270	49,221

309. Representative sample plots were laid out in the different bamboos coupes and a complete enumeration of all clumps and culms were made in each plot. The results are given below :—

Name of the coupe.	Plot number.	Area in acres.	Total number of clumps.	Total number of culms.	Average number of culms per clump.
Hullikal I	1	1	85	1,278	15
	2	1	28	276	10
Hullikal II	1	1	94	1,103	12
	2	1	47	557	12
Hullikal III	1	1	22	293	13
	2	1	23	195	9
Vagapanai I	1	1	77	802	10
	2	1	60	669	11
Vagapanai II	1	1	222	3,431	15
	2	1	82	1,376	17
Vagapanai III	1	1	80	1,325	17
	2	1	97	921	9

It will be seen that on an average a clump of bamboos in this region has about 13 culms.

Section 7—Miscellaneous statistics.

310. *Outturn tables for teak and other exploitable species of the deciduous forest of Mudumalai range.*—Figures relating to actual outturn of timber after conversion and the

corresponding girth of trees at breast height abstracted from Form 3 register were grouped in one foot girth classes and averaged. The relationship between the average outturn of timber and the corresponding mean girth is given in the following table :—

Girth of the tree in inches at breast height.	Outturn of convested timber in cubic feet.				
	Teak.	Mathi.	Vengai.	Venteak.	Rosewood.
24	3·0	5·0	5·0	4·5	4·0
30	4·9	7·2	7·0	6·3	6·0
36	6·5	9·4	9·1	8·4	8·6
42	9·0	11·7	11·2	10·8	11·3
48	11·6	14·2	13·6	13·2	14·7
54	14·6	16·8	16·3	16·7	18·2
60	18·3	21·0	19·5	20·2	22·4
66	22·1	25·3	23·2	24·2	26·6
72	27·0	30·1	26·5	28·0	32·0
78	32·0	35·3	39·3	31·8	37·7
84	37·4	41·1	35·0	36·0	44·3
90	42·9	47·1	39·8	40·9	52·7
96	49·3	53·0	45·4	46·5	59·0
102	56·6	60·9	51·0	52·3	68·0
108	64·0	..	..	..	..

311. *Distribution of the various species of exploitable timber in the deciduous forest of Mudumalai range.*—Enumerations made at the time of the compilation of the last working plan reveal that the percentage distribution between the exploitable timber species, viz., teak, rosewood, mathi, vengai and venteak is 39·8 per cent, 3·0 per cent, 45·5 per cent, 5·5 per cent and 6·2 per cent respectively as regards the number of trees over 2 feet girth. As regards the volume of the outturn possible from them, the percentage distribution is 33·8 per cent, 4·7 per cent, 49·2 per cent, 5·7 per cent and 6·7 per cent respectively. The following abstract gives the details of distribution of the number of trees and the volume of the expected outturn based on the enumerations done at the time of the preparation of the last plan :—

Total number of compartments enumerated	*Total area of compartments.*	*Number of trees.*	*Volume of outturn in c.ft.*	*Number of trees.*	*Volume of outturn in c.ft.*	*Number of trees.*	*Volume of outturn in c.ft.*	*Number of trees.*	*Volume of outturn in c.ft.*	*Number of trees.*	*Volume of outturn in c.ft.*
18	21,314	31,607	365,826	2,442	52,605	36,292	547,504	4,040	63,801	5,370	75,676

312. Details of the enumerations done at the time of the preparation of this working plan and the results thereof will be found in paragraph 498.

PART II.

Future management discussed and prescribed.

CHAPTER I.

Basis of Proposals.

Section 1—General objects of management.

313. This working plan deals with the whole of the Nilgiris Forest Division as constituted at present (1952). The object of management are various and may be briefly stated as follows :—

(i) To preserve the sholas of the Nilgiri plateau which lie in the catchment area of the Bhavani and the Moyar, both for the regulation of the flow of the waters in the streams and for retaining the beauty of Nilgiri hills ;

(ii) to work the blue gum plantations of the plateau for the supply of firewood and timber and Eucalyptus oil on a sustained basis and to increase the area under blue gum to meet the increasing demands of the local and neighbouring population ;

(iii) to grow wattle on a large scale to meet the demands for its tannin bark and incidentally supply its wood as fuel to the local population or the neighbouring people ;

(iv) to grow pyrethrum on a limited scale to supply the requirements of the insecticidal extract of pyrethrum to the various institutions of the State for use in particular on anti-malarial operations ;

(v) to extract the mature teak and other merchantable timber in the forests of Mudumalai range with due regard to the silvicultural principles ;

(vi) to improve the value of the Mudumalai forests by raising teak plantations and to tend the plantations already raised in the area with a view to obtain the maximum yield ;

(vii) to extract the dead sandal in the Sigur and Coonoor ranges ;

(viii) to exploit the resources of the forests in regard to the minor forest produce in all the ranges ;

(ix) to work on a regular felling cycle the bamboos found on the Nilgiri Eastern Slopes in Coonoor range ;

(x) to provide grazing facilities for the cattle of the Todas and Badagas in keeping with their ways of migratory grazing and for other cattle that resort to the pastures of the division.

(xi) to protect the forests against damage by fire and man ;

(xii) to provide the domestic needs of the aboriginal tribes who depend on the forests for their livelihood and of the local population ;

(xiii) to grow willows in the swampy areas ;

(xiv) to improve the facilities for the accommodation of the range staff wherever necessary and in particular in Mudumalai and Sigur ranges ;

(xv) to capture wild elephants roaming in the vicinity of the Moyar by pit method, train them and sell them ; and

(xvi) generally to take all steps to attain the maximum financial return per acre of forest in perpetuity.

Section 2—Method of treatment to be adopted.

314. The methods of treatment to be adopted varies with each of the working circles and are described in detail in the following chapters in the case of each working circle. Prescriptions and suggestions on matters not covered by the different working circles are indicated in the chapter on "Miscellaneous Regulations."

Section 3—Working Circles, their area and distributions.

315. In accordance with the objects of management in view, nine working circles have been constituted. The following statement shows the distribution of the several working circles :—

Number and name of the working circle.	Area in acres.
1 The Blue Gum Working Circle	2,493·03
2 The Wattle Working Circle	3,434·81
3 The Pyrethrum Working Circle	639·03
4 The Selection Working Circle	33,924·00
5 The Teak Working Circle	1,981·51
6 The Sandalwood Working Circle	88,824·00
7 The Bamboo Working Circle	5,422·00
8 The Grazing Working Circle	313,177·10
9 The Minor Forest Produce Working Circle	All the reserves and the unreserves of the division.

Section 4—Period of the Working Plan.

316. This working plan will be in force for a period of ten years from 1st April 1954 to 31st March 1964. Indications regarding the areas to be worked in the succeeding five years have also been made so that work may be carried on according to this plan, in case the next revision of the plan is not taken up in time.

CHAPTER II.

WORKING PLAN FOR THE BLUE GUM WORKING CIRCLE.

Section 1—General constitution of the working circle.

317. The increase in demand for firewood, due to the general increase of the population and the depletion of the private sources of firewood by rapid exploitation in the recent past, either for immediate gain or for conversion of the lands into more profitable potato fields, make it imperative, that the extent of the blue gum plantations in the Nilgiris Division should be increased. Accordingly, the Blue Gum Working Circle of this plan would include :—

(i) all the areas included under the Coppice Working Circle of the previous plan ;

(ii) most of the areas under the Hardwood Eucalyptus Working Circle of the previous plan, part of which had already been converted into blue gum in the recent past and the rest destined for conversion during this plan, as the Hardwood Eucalyptus were not found in this locality to produce good timber ;

(iii) scattered wattle plantations converted into blue gum, as it was found difficult to protect such isolated wattle areas against stealthy stripping off of the bark from the standing trees ;

(iv) some of the areas not included under the Coppice Working Circle of the last plan but were brought under blue gum during the recent past, either by extension of plantations in grassy areas or by the Grow-More-Food leases during the World War II, when blue gum was raised in scattered pieces of forest land after cultivation with potato, and

(v) new areas to be brought under blue gum on either side of the road branching off from the Ootacamund-Mysore Road and leading to Glenmorgan.

318. The total area of the working circle is 2,493·03 acres, and the area under blue-gum in this working circle, at the time of the prepartion of this plan (1952) is 1,991·63 acres. The rest of the area will be brought under blue gum during the period of this plan, either by planting up grassy areas or by the convertion of the Hardwood Eucalyptus and other plantations, as prescribed in this plan. The area of the Hardwood Eucalyptus plantations already converted into blue gum is 105·55 acres and the area destined for conversion is 249·50 acres.

319. The Blue Gum Working Circle is made up of twelve felling series, six of which will be allotted to Ootacamund North Range, two to Ootacamund South Range and four to Coonoor Range. The distribution of the area included in this Working Circle is as follows :—

Number and name of the range.	Names of the felling series in the range.	Area in acres.
1 Ootacamund North	1 Aramby	228·10
	2 Doddabetta	275·52
	3 Glenmorgan	225·00
	4 Governorshola	273·82
	5 Muthinad	130·83
	6 Snowdon	188·30
		1,381·57
2 Ootacamund South	1 Cairnhill	268·80
	2 Ketti	94·40
		363·20
3 Coonoor	1 Bandyshola	197·14
	2 Blackbridge	172·37
	3 Coonoor Peak	228·74
	4 Rallia	150·01
		748·26

320. The following statement gives particulars of the different blocks and compartments included in the several felling series constituted under this working circle :—

Number and name of the felling series.	Block.	Compartments.	Area in acres.
	Ootacamund North Range.		
1 Aramby	Aramby II	1 to 18	66·25
	Aramby III	1 to 13	83·00
	Aramby V	1 to 10, 12 to 15 and 17*a*.	77·55
	Aramby VI	3, 7 and 8	14·50
	Aramby VII	1 to 4	46·80
			288·10
2 Doddabetta ..	Doddabetta	1 to 7	122·47
	Newman	1 to 9	26·30
	Dharmatope	1	13·50
	Honnathalai	1 to 5	61·25
	Mynalai	1	26·00
	Jackunda	1	26·00
			275·52
3 Glenmorgan ..	Glenmorgan	1 to 15	225·00
			225·00

Number and name of the felling series.	Block.	Compartments.	Area in acres.
	Ootacamund North Range—cont.		
4 Governorshola ..	Governorshola I (Chowghat Culli).	1 and 2	30·50
	Governorshola II (Culli) ..	1 and 2	18·50
	Governorshola III (Sheffield) ..	1 to 3	32·00
	Governorshola IV (Andy) ..	1 to 4	46·85
	Governorshola V (Huppatty)	1 and 2	25·00
	Governorshola VI	1 to 5	58·47
	Governorshola VII (Aranaikal) ..	1	10·50
	Governorshola VIII (Chemanguli).	1 to 3	32·00
	Hogdson's Hill	1 and 2	20·00
			273·82
5 Muthinad ..	Muthinad	1 to 10	72·32
	Brooklands	1 to 11	58·51
			130·83
6 Snowdon ..	Snowdon I	1 to 9	50·30
	Snowdon II	1 to 6 and 8 ..	97·10
	Marlimund III	1 to 5	40·90
			188·30
	Ootacamund South Range.		
7 Cairnhill	Cairnhill I	3, 4 and 9*b* ..	30·69
	Cairnhill II	1 to 21	102·96
	Cairnhill III	1 and 2	10·50
	Cairnhill IV (Madanna and Baikie).	1 to 8	87·65
	Elkhill	1	15·00
	Cairnhill Addition	1 and 2	6·00
	Fairlawns	1 to 5	16·00
			268·80
8 Ketti	Ketti	1 to 14	66·40
	Lovedale	1 to 5	28·00
			94·40
	Coonoor Range.		
9 Bandyshola ..	Bandyshola	1 to 30	92·34
	Bleakhouse	1 to 10	55·05
	Tiger Hill	1	11·35
	Tent Hill	1	7·25
	Springfield	1 to 5	27·95
	Ghat Reserve	1	3·20
			197·14
10 Blackbridge ..	Blackbridge	1 to 17	141·75
	Teppakuchi	1 to 3	30·62
			172·37
11 Coonoor Peak ..	Coonoor Peak I	1 to 40	217·19
	Coonoor (Teneriffe) II	2	11·55
			228·74
12 Rallia	Rallia	1 to 15 ..	98·41
	Little Rallia	1 to 3	10·50
	Naduhatti	1	10·00
	Longwood	1	5·60
	Sullicode	1 to 3	25·50
			150·01

Section 2—Blocks and compartments.

321. The blocks and the compartments included in this working circle have been shown in the preceding statement. Practically, all the compartments included in the previous plan have been numbered in this plan in the same way, so that the previous history

of the area may be traced easily and the compartment histories maintained continuously. In the case of Teppakuchi Block, the block is divided in this plan into three compartments using the easily distinguishable features available in the field, and the division is based on the future distribution of the age gradations of the crop in that block. Where the compartments had been found to be too big, for the permissible annual exploitation in a particular felling series, they have been subdivided into sub-compartments, as in the following cases ; Doddabetta 3 and 4 have been subdivided into *3a*, *3b and 4a*, *4b* and *4c* ; Snowdon II compartment 8 has been subdivided into *8a* and *8b* ; Snowdon I Compartment 2 has been divided into two sub-compartments, *2a* and *2b*.

322. The areas which are now being brought into the Blue Gum Working Circle are Aramby VI compartments 3, 7 and 8, Aramby VII-2, Addition 2, Glenmorgan Block, Hogdson's Hill 1 and 2, Governorshola (Andy) IV-4, Governorshola (Sheffield) III-3, Brooklands Block Compartments 1 to 5 and 11, Snowdon Block I, Elkhill 1, Fairlawns 1 to 5, Cairnhill Addition 1 and 2, Ketti 1 to 14, Lovedale 1 to 5, Bandyshola 1 to 9 and 25 to 30, Springfield 1 to 5, Ghat Reserve 1, Blackbridge 6 to 17, Naduhatti 1, Longwood 1 and Sullicode 1 to 3. Where new areas are included the name of the locality has been adopted as block name and the compartments in the block given different numbers.

323. Detailed descriptions of the compartments will be found in Appendix XII to this plan.

324. Maps of the plantations, included in this working circle, on a scale of 8 inches = 1 mile accompany this plan.

Section 3—Analysis of the crop.

325. The blue gum crop in each compartment included in this working circle are classified into three quality classes, with reference to the average height of the dominant trees in each compartment and according to the Quality Class Tables for Blue Gum given in paragraph 282 of this plan. The areas destined for conversion into blue gum plantations have been uniformly taken as the medium quality, for the time being. The following statement gives the distribution of the quality classes, in respect of the areas included in this working circle :—

Number and name of the felling series.	*Total area of the series in acres.*	*Area under first quality.*	*Area under second quality.*	*Area under third quality.*	*Total area reduced to first quality.*
1 Aramby	288·10	Nil.	7·07	281·03	145·82
2 Doddabetta	275·52	Nil.	171·95	103·57	180·75
3 Governorshola	273·82	29·60	114·82	129·40	180·41
4 Glenmorgan	225·00	Nil.	225·00	Nil.	168·75
5 Muthinad	130·83	6·95	59·03	64·85	83·65
6 Snowdon	188·30	50·10	77·50	60·70	138·58
7 Cairnhill	268·80	45·31	135·46	88·03	190·92
8 Ketti	94·40	Nil.	89·60	4·80	69·60
9 Bandyshola	197·14	Nil.	149·06	48·08	135·83
10 Blackbridge	172·37	Nil.	Nil.	172·37	86·19
11 Coonoor Peck	228·74	17·55	113·07	98·12	151·41
12 Rallia	150·01	3·05	41·08	105·43	87·02
	2,493·03	153·01	1,183·64	1,156·38	1,618·93

326. It will be seen from the preceding statement, that out of the total area of about 2,493 acres, the extent of plantations that will fall under first quality will be about 153 acres, while the area under the second and third qualities will be about 1,184 and 1,156 acres respectively. The percentage distribution of the first, the second and the third qualities is therefore, 6·2, 47·3 and 46·5 per cent respectively.

327. The reduced area (Vide paragraph 338) of each series is given in the last column of the preceding statement. The areas under each quality class had been reduced to first quality, using reducing factors based on the proportinate yield at the rotation age. The total reduced area of this working circle works to 1,618·93 acres. Accordingly each age gradation of the blue gum crop should occupy theoretically a reduced area of 107·93 acres for the prescribed rotation of 15 years (Vide paragraph 337). When the areas included in this working circle are worked according to this plan, a practically uniform distribution of age gradations will come into being, at the close of the rotation age of 15 years. A succession of nearly equi-productive areas of the 15 age gradations will be established, because the annual cut in the felling series had been fixed on the basis of reduced areas. A sustained yield of $\frac{87 + 70}{2}$ lots per acre × 107·93 × 1-4/5 tons per lot, i.e., about 15,000 tons will be available annually after the establishment of a regular succession of the age gradations.

328. An analysis of the distribution of the different age gradations of the blue gum plantations of the previous plan, which are existing at the time of the preparation of this working plan (1952) is made in order to see the result of the past working of the fuel coupes, on the distribution of the age gradations in the different felling series of blue gum plantations of the previous plan. The total reduced area of all the plantations included in each series of the last plan is taken and the reduced area of each age gradation existing at present is compared so as to know the distribution existing at the commencement of this plan. The distribution percentage is also calculated in each case. The results are given in the succeeding two statements. The total reduced area of all the plantations of the different series works to 977·82 acres, and for a 15-year rotation, each age gradation should theoretically occupy a reduced area of 65·19 acres. That is to say, each age gradation should have 6⅔ per cent of the total area, for a normal distribution, which will be achieved at the end of the prescribed rotation, when the different areas are worked according to this plan.

Number and name of the felling series of the previous plan.	*Distribution of age gradations in acres of the Bluegum crop resulting from the working of the fuel coupes in areas covered by the Coppice Working Circle of the previous plan. The areas given are all reduced to the first quality.*					
	1 year.	*2 years.*	*3 years.*	*4 years.*	*5 years.*	*6 years.*
1 Aramby	8·19	11·23	6·03	12·31	5·94	10·10
2 Cairnhill	Nil	6·02	10·20	6·08	12·39	Nil
3 Governorshola	5·10	Nil	17·75	7·88	8·34	Nil
4 Snowdon	Nil	10·85	Nil	2·25	Nil	4·70
5 Muthinad	3·38	2·78	Nil	9·58	5·75	19·07
6 Coonoor Peak	8·33	8·42	17·74	7·65	Nil	19·01
7 Bandyshola	6·10	13·62	Nil	9·29	6·21	Nil
8 Rallia	3·38	3·50	6·22	8·09	4·90	7·88
9 Teppakuchi	Nil	Nil	Nil	Nil	Nil	Nil
	34·39	56·42	57·94	63·13	43·53	60·76
Deviation from the normal ..	— 30·80	— 8·77	— 7·25	— 2·06	— 21·66	— 4·33

	Distribution of the age gradations in acres of the Bluegum crop resulting from the working of the fuel coupes in areas covered by the Coppice Working Circle of the previous plan. The areas given are all reduced to the first quality—cont.					
	7 years.	*8 years.*	*9 years.*	*10 years.*	*11 years.*	*12 years.*
1 Aramby	8·08	17·47	6·25	17·47	7·50	6·71
2 Cairnhill	4·84	24·97	16·96	6·23	14·78	9·05
3 Governorshola	26·31	26·63	12·60	Nil	16·25	17·05
4 Snowdon	3·34	14·13	24·45	9·98	24·00	8·90
5 Muthinad	4·88	10·73	Nil	Nil	Nil	Nil
6 Coonoor Peak	24·89	8·08	6·13	4·18	9·96	13·16
7 Bandishola	4·10	9·31	2·54	3·58	4·32	5·34
8 Rallia	3·63	5·26	3·76	Nil	Nil	Nil
9 Teppakuchi	Nil	Nil	Nil	Nil	Nil	Nil
	80·07	116·58	72·69	41·40	76·81	60·21
Deviation from the normal ..	+ 14·88	+51·39	+7·50	— 23·79	+11·62	— 4·98

	Distribution of the age gradations in acres of the Bluegum crop resulting from the working of the fuel coupes in areas covered by the Coppice Working Circle of the previous plan. The areas given are all reduced to the first quality—cont.			*Total reduced area of the Bluegum plantations of the previous plan in 1952.*
	13 years.	*14 years.*	*15 years and over.*	
1 Aramby	5·55	9·98	13·05	145·82
2 Cairnhill	7·95	8·00	19·86	147·33
3 Governorshohla	3·75	5·75	Nil	147·41
4 Snowdon	5·10	6·38	8·10	122·18
5 Muthinad	Nil	Nil	34·88	91·05
6 Conooor Peak	5·37	15·08	4·31	152·31
7 Bandyshola	1·35	1·90	3·63	71·20
8 Rallia	Nil	Nil	38·58	85·20
9 Teppakuchi	Nil	Nil	15·32	15·32
	29·07	47·09	137·73	977·82
Deviation from the normal ..	— 36·12	— 18·10	+ 72·52	—

Distribution of the age gradations in the preceding statement expressed as percentages.

Number and name of the felling series of the previous plan.	1 *year.*	2 *years.*	3 *years.*	4 *years.*	5 *years.*
1 Aramby	6	8	4	8	4
2 Cairnhill	0	4	7	4	8
3 Governorshola	4	0	12	5	6
4 Snowdon	0	9	0	2	0
5 Muthinad	4	3	0	10	6
6 Coonoor Peak	6	6	12	5	0
7 Bandyshola	8	18	0	13	9
8 Rallia	4	4	7	10	6
9 Teppakuchi	0	0	0	0	0
Percentage distribution for all the series taken together.	4	6	6	7	4
Deviation from the normal	— 2·6	— 0·6	— 0·6	+ 0·4	— 2·6

	6 *years.*	7 *years.*	8 *years.*	9 *years.*	10 *years.*
1 Aramby	7	5	12	4	12
2 Cairnhill	0	3	17	12	5
3 Governorshola	0	18	18	9	0
4 Snowdon	4	3	12	18	9
5 Muthinad	22	5	11	0	0
6 Coonoor Peak	13	16	5	4	2
7 Bandyshola	0	6	13	4	5
8 Rallia	9	4	6	5	0
9 Teppakuchi	0	0	0	0	0
Percentage distribution for all the series taken together.	6	8	12	7	4
Deviation from the normal	— 0·6	+ 1·4	+ ·54	+ 0·4	— 2·6

	11 *years.*	12 *years.*	13 *years.*	14 *years.*	15 *years and over.*
1 Aramby	5	5	4	7	9
2 Cairnhill	10	6	5	5	14
3 Governorshola	10	11	3	4	0
4 Snowdon	19	8	4	5	7
5 Muthinad	0	0	0	0	39
6 Coonoor Peak	7	9	3	10	2
7 Bandyshola	6	8	2	3	5
8 Rallia	0	0	0	0	45
9 Teppakuchi	0	0	0	0	100
Percentage distribution for all the series taken together.	8	6	3	5	14
Deviation from the normal	+ 1·4	— 0·6	— 3·6	— 1·6	+ 7·4

329. It will be seen from the preceding two statements, that the distribution of the different age gradations is far from normal. One of the main reasons for failure to achieve an even distribution during the last working plan period is the advance fellings in some of the easily exploitable coupes, necessitated by the heavy demands made during the World War II. Subsequently, the failure to undertake the revision of the plan before it lapsed and the working of the plantations under periodic schemes, which took into consideration only the immediate needs and did not attempt any re-adjustments to normally pending the prospective revision of the plan in a near future, caused further disturbance in the distribution of the age gradations.

330. The reasons for the heavy preponderance of the last age gradation are the non-working of Teppakuchi plantations even after the lapse of the last working plan and the commencement of work in Muthinad and Rallia Series only during the middle of the last working plan period. The equally heavy representation of the 8-year age gradation is due to the heavy incidence of felling during 1944–45 to meet the heavy demands of the war period. The shortening of the rotation during the middle of the working plan period to make increased supplies had affected the age gradations of the different series both individually and severally. The representation of the age gradations in Muthinad, Rallia and Teppakuchi is grossly abnormal.

Section 4—Method of treatment.

331. The treatment proposed is—(i) to clearfell the plantations (mainly for firewood) under the simple coppice system; (ii) to convert the other plantations included in this working circle into blue gum, after clearfelling them (mainly for firewood); (iii) to plant with blue gum the grassy areas whenever available contiguous to the old compartments and to afforest with blue gum the area demarcated for Glenmorgan series; and (*iv*) to replant with blue gum, the blue gum coppice areas, at the end of four coppice rotations.

332. *Silvicultural System.*—The system adopted will be mainly the simple coppice system except in the case of the non-blue gum areas, where the system followed will be clearfelling and conversion into blue gum by concentrated artificial regeneration and in the case of the planting up of grassy areas, it will be afforestation by concentrated artificial regeneration.

333. *Rotations.*—The rotation, on which the blue gum plantations in this working circle, will be worked depends upon the following objects of management : (i) to meet the local demand for firewood by supplying the sizes readily absorbed by the market and most favoured by the consumers and (ii) to obtain the highest possible financial return by the working of the fuel coupes with due silvicultural considerations.

334. The size of billets favoured by the consumers is about 6 to 8 inches in diameter. The minimum age at which the average blue gum plantations of the locality produce a high proportion of the desired size of billets is 15 years. The " Technical " rotation will, therefore, be 15 years.

335. A study of the mean annual increment curves based on the data given in paragraph 284, reveals that the mean annual increment culminates just before the commencement of the tenth year in the case of the first quality plantations, while in the case of the second quality just after the completion of the tenth year and in the case of the third quality just after the completion of the eleventh year. It is, therefore, clear that from the point of view of the outturn of firewood, the age at which the rate of volume production is the maximum, can in no case exceed twelve years. Any departure from the rotation indicated by the culminating point of the mean annual increment involves a sacrifice of production and any rotation fixed beyond that age, on other considerations, should be as near to it as possible, if the loss in the rate of outturn is to be small. Since the main object of management is to produce firewood billets of a size and quality acceptable to consumers, it is not advisable to adopt a rotation lower than 15 years because poor quality areas are not likely to produce a good proportion of the favoured size of billets earlier than 15 years.

336. The determination of the financial rotation can never be accurate as it is based on price increment, which is often an unpredictable variable. However, for coppice crops the simple formula for the " net rental " can be easily worked out, and the figure obtained may be used at least to see, whether the age at which the crop is cut on the basis of the technical rotation can be prolonged with a view to attain a higher financial return. Substituting the relevant values for 20, 18 and 15 years from the average prices obtained in the recent past, in the following formula :—

$$\text{Net Rental} = \frac{Yx\ .op}{1\ .opr - 1}$$

where Y—the net value obtained for the crop, p—the rate of interest ($3\frac{1}{2}$ per cent) and r—the rotation in years, the following values are obtained :—

For 20 years, the value of Net Rental

$$\text{Rs.}\ \frac{755 \times .035}{1{\cdot}9898 - 1} = \text{Rs. } 21{\cdot}77.$$

For 18 years, the value of Net Rental

$$\text{Rs.}\ \frac{548 \times {\cdot}035}{1{\cdot}8312 - 1} = \text{Rs. } 23{\cdot}08.$$

For 15 years, the value of Net Rental

$$\text{Rs.}\ \frac{523 \times {\cdot}035}{1{\cdot}6753 - 1} = \text{Rs. } 28{\cdot}11.$$

It will be evident from the above values, that with a view for a higher financial return, it is not necessary to increase the rotation of 15 years arrived at on other considerations.

337. Based on the considerations detailed above, the rotation at which the blue gum plantations can be felled is fixed as 15 years.

338. *Regulation of yield.*—The yield will be regulated by area. In order to have a sustained yield, it is necessary that each age gradation should occupy areas of equal productivity rather than of equal extent. Hence, before the areas of the different compartments in each felling series are distributed for the fifteen annual cuttings based on the rotation fixed above, they have to be reduced to a uniform quality, dependant on the productivity (quality of the stands) of the compartments. It will be seen from the outturn tables given in paragraph 283 that at the rotation age of 15 years, the yield between the three qualities are in the proportion $1 : \frac{3}{4} : \frac{1}{2}$. Therefore, using a reducing factor of 0·75 and 0·5 respectively the second and the third quality areas had been reduced to first quality. All areas in each felling series had been reduced to first quality and about one-fifteenth of the total reduced area of each series allotted for annual exploitation. In view of the fact that the entire compartments or sub-compartments have to be the units of working, they had been so distributed that the extent of annual cut in each series is very nearly

equal to the theoretical average, and that the plantations are felled as nearly as possible to the rotation age, with a view to attain a regular succession of very nearly equiproductive fifteen age gradations at the end of the prescribed rotation.

339. The yield expected to be realised annually from each of the felling series during the rotation period of 15 years commencing from 1954–55 is shown in the following statement. Details of yield in the case of each compartment are shown in the Tabular Statement of Fellings (vide paragraph 345). The yields have been calculated with reference to the out-turn tables in paragraph 283, after making due allowance for deterioration in production in successive rotations.

Annual Yield in lots from each Felling Series in the Blue Gum Working Circle during 1954–55 to 1968–69.

(1 lot = 120 stacked cubic feet.)

Ootacamund North Range.

Year of felling.	Aramby Felling Series.	Doddabetta Felling Series.	Governor-shola Felling Series.	Muthinad Felling Series.	Snowdon Felling Series.	Total yield in lots of 120 c.ft.
1954–55	752	930	720	386	710	3,498
1955–56	746	930	1,000	440	712	3,828
1956–57	710	854	904	462	640	3,570
1957–58	764	854	880	429	640	3,567
1958–59	762	855	1,008	416	640	3,681
1959–60	748	950	930	480	745	3,853
1960–61	864	815	1,200	449	720	4,048
1961–62	878	1,116	1,116	394	960	4,464
1962–63	853	1,012	912	372	648	3,797
1963–64	794	1,041	1,026	486	732	4,079
1964–65	666	1,041	920	410	788	3,825
1965–66	762	1,041	1,037	556	710	4,106
1966–67	785	1,040	1,038	550	840	4,253
1967–68	790	1,040	960	496	882	4,168
1968–69	798	930	800	368	720	3,616
Total yield in lots from the whole series.	11,672	14,449	14,451	6,694	11,087	58,353

Ootacamund South Range.

Year of felling.	Cairnhill Felling Series.	Ketti Felling Series.	Total yield in lots of 120 c.ft.
1954–55	955	246	1,201
1955–56	1,044	246	1,290
1956–57	1,114	246	1,360
1957–58	1,046	457	1,503
1958–59	877	408	1,285
1959–60	1,080	493	1,573
1960–61	912	450	1,362
1961–62	897	450	1,347
1962–63	1,065	294	1,359
1963–64	987	480	1,467
1964–65	936	300	1,236
1965–66	1,082	420	1,502
1966–67	990	360	1,350
1967–68	1,089	360	1,449
1968–69	1,157	360	1,517
Total yield in lots from the whole series.	15,231	5,570	20,801

Coonoor Range.

Year of felling.	Bandyshola Felling Series.	Black Bridge Felling Series.	Coonoor Peak Felling Series.	Rallia.	Total yield in lots of 120 c.ft.
1954–55	666	602	816	496	2,580
1955–56	644	408	665	420	2,137
1956–57	580	405	796	400	2,181
1957–58	777	400	824	390	2,391
1958–59	776	400	774	461	2,411
1959–60	674	400	740	397	2,211
1960–61	826	400	811	430	2,467
1961–62	716	400	775	560	2,451
1962–63	697	400	779	490	2,366
1963–64	906	400	892	520	2,718
1964–65	629	529	903	516	2,577
1965–66	693	510	924	473	2,600
1966–67	783	473	931	522	2,709
1967–68	730	474	790	470	2,464
1968–69	702	644	777	478	2,601
Total yield in lots from the whole series.	10,799	6,845	12,197	7,023	36,864

Section 5—Method of executing the fellings.

340. All trees in the compartments or sub-compartments allotted for each year will be completely clearfelled, except for a row of trees on the periphery which will be retained while the other trees in the area are coppiced. Isolated standards of blue gum which lie scattered inside some of the compartments will also be felled when the area is to be clearfelled. The compartments or sub-compartments allotted for the year will be sold as fuel coupes, including the right to fell standards, if any, inside the area. If for any reason, any compartment is not sold for the allotted year, it will have to be sold the next year along with the compartments allotted for that year, but not in lieu of any of them.

341. The trees in the allotted area will be felled by using saws, the cut being not higher than six inches above the ground level or within six inches above the previous cut in the case of second and subsequent coppicing. The felled firewood will be sawn into billets of 3 feet or $1\frac{1}{2}$ feet length and stacked before removal. The size of the standard stack or ' lot ' is 8 feet by 5 feet by 3 feet. All material down to 6 inches in girth will be stacked. The subordinates concerned will keep an account of the removals and submit it to the Range Officer periodically. The purchaser of the fuel coupe can remove such of the produce in the area as he desires either in the shape of timber or in any fashion. Brenchwood (i.e., all material below 6 inches in girth) in the area under felling may be sold by the contractor by the issue of head-load tickets at rates approved by the District Forest Officer. The purchaser of the coupe may also remove for distillation of oil the leaves left on the trees after previous years' lopping (vide paragraph 364).

342. Each compartment or sub-compartment allotted for the year will be a unit of lease. In order to achieve uniform supplies of firewood to the public throughout the year and in view of the small extent of the various units, one set of compartments allotted for the year will be sold in February with a lease period from the 1st April to the 30th September and another set sold in August with a lease period from the 1st October to the 31st March. The working plan indicates (vide paragraph 345), the compartments to be worked in a particular year in the case of each series. The District Forest Officer will have the discretion to choose among them, one set for the first sale and the rest for the second sale of the year. If in the case of any compartment the District Forest Officer considers a longer lease period is necessary, he may fix in the sale notice a lease period larger than six months but not exceeding nine months. Such leases for a period exceeding six months will be includ d in the first sale. The District Forest Officer will also include in that sale such of the compartments which are to be regenerated by complete replanting with seedlings during the next year (vide paragraph 348). Normally, the total extent of the area of the lease units chosen for each sale will approximately be half the total area of the annual cut prescribed for the year.

343. All areas offered for sale will be surveyed before sale and the area computed from such survey will be adopted for the sale.

344. As stated in paragraph 340 one row of blue gum trees along the periphery will be retained, while coppice fellings take place in the compartments. These trees on the periphery will serve as a wind-belt as well as aid in the clear understanding of the line of demarcation between one compartment and another. However, they have to be felled periodically so that they may not become over-mature. It will be remembered that on the plateau there are very few timber trees to meet the requirements of the common man for his ordinary constructional purposes. Blue gum is preferred locally for rough constructional works, by those who cannot afford the costly imported timber. It would not be profitable to set apart certain blue gum areas entirely for timber production as the demand is limited. Coppice with standards method had been tried and not found successful in the case of this species. Hence, the peripheral blue gum trees which will not be felled during each coppice rotation, will be made to meet the limited but continued requirements of blue gum timber of the local population. The peripheral trees will be felled when they are 60 years old, i.e., when the compartment is felled for complete replanting with seedlings at the end of four coppice rotations (vide paragraph 348). Replanting along the periphery with blue gum will be done 6 feet apart when the compartment is replanted (vide paragraph 360). The District Forest Officer will sell the peripheral standards separately during the second sale of the year, as the right to fell all trees inside the compartment would have been sold during the first sale according to the prescription (vide paragraph 342). No case of such sale of peripheral standards will arise during the period of this plan.

Section 6—Tabular statement of fellings.

345. The following statements show the compartments or sub-compartments to be worked annually in each of the felling series included in the Blue Gum Working Circle:—

Ootacamund North Range.

Aramby Felling Series.

Total area—288·10 acres.
Total reduced area—145·82 acres.

Year of felling.	*Block and compartment number.*		*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality-I in acres.*	*Estimated yield in lots of 120 c.ft.*	*Remarks.*
1954–55 ..	.. Aramby II	5	15	3·17	II	2·38	190	
	Aramby V	3	15	6·30	III	3·15	252	
	Aramby V	6	14/15	7·75	II	3·88	310	
				17·22		9·41	752	
1955–56 ..	.. Aramby V	5	15	5·65	III	2·83	226	
	Aramby II	6	14/15	2·50	III	1·25	100	
	Aramby III	8	14/15	10·50	III	5·25	420	
				18·65		9·33	746	
1956–57 ..	.. Aramby II	7	15	2·00	III	1·00	80	
	Aramby III	9	14/15	11·50	III	5·75	460	
	Aramby II	10	14/15	4·25	III	2·13	170	
				17·75		8·88	710	
1957–58 ..	.. Aramby VI	7	15	4·70	III	2·35	188	
	Aramby VI	8	15	4·90	III	2·45	196	
	Aramby III	2	15	9·50	III	4·75	380	
				19·10		9·55	764	
1958–59 ..	.. Aramby V	10	14/15	1·00	III	0·50	40	
	Aramby V	13	14/15	3·20	III	1·60	128	
	Aramby II	12	14/15	2·33	III	1·17	94	
	Aramby II	1	14/15	6·50	III	3·25	260	
	Aramby VII	1	14/15	6·00	III	3·00	240	
				19·03		9·52	762	
1959–60 ..	.. Aramby VII	2	15	11·00	III	5·50	440	
	Aramby III	5	14/15	2·8	III	1·40	112	
	Aramby VI	3	15	4·9	III	2·45	196	
				18·70		9·35	748	
1960–61 ..	.. Aramby II	3	14/15	3·85	III	1·93	154	
	Aramby III	11	15	5·25	III	2·63	210	
	Aramby VII	2						
	addition		16	12·50	III	6·25	500	
				21·60		10·81	864	

Ootacamund North Range—*cont.*

Aramby Felling Series—cont.

Year of felling.	*Block and compartment number.*		*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 c.ft.*	*Remarks*
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
1961–62	Aramby II	16	15	4·14	III	2·07	166	
	Aramby V	14	15	4·90	III	2·45	196	
	Aramby V	17a	15	4·80	III	2·40	192	
	Aramby III	1	16	5·50	III	2·75	220	
	Aramby III	12	16	2·60	III	1·30	104	
				21·94		10·97	878	
1962–63 ..	Aramby II	15	16	2·50	III	1·25	100	
	Aramby VII	3b	15	3·50	III	1·75	140	
	Aramby VII	3a	15	3·25	III	1·63	130	
	Aramby III	10	14/15	4·55	III	2·28	182	
	Aramby III	6	14/15	5·40	III	2·70	216	
	Aramby II	8	15	2·12	III	1·06	85	
				21·32		10·67	853	
1963–64	Aramby III	13	15	10·20	III	5·10	408	
	Aramby II	9	15	2·25	III	1·13	90	
	Aramby II	11	15	3·50	III	1·75	140	
	Aramby VII	3c	14/15	3·90	III	1·95	156	
				19·85		9·93	794	
1964–65	Aramby II	13	15	2·27	III	1·14	91	
	Aramby II	18	14/15	8·50	III	4·25	340	
	Aramby V	9	15	3·12	III	1·56	125	
	Aramby VII	4a	15	2·75	III	1·38	110	
				16·64		8·33	666	
1965–66	Aramby II	2	15	3·50	III	1·75	140	
	Aramby II	4	14/15	5·10	III	2·55	204	
	Aramby III	3	15	4·60	III	2·30	184	
	Aramby VII	4b	15	3·90	II	2·93	234	
				17·10		9·53	762	
1966–67	Aramby II	14	14/15	2·40	III	1·20	96	
	Aramby II	17	15	5·37	III	2·69	215	
	Aramby V	7	15	5·50	III	2·75	220	
	Aramby V	8	14/15	6·25	III	3·18	254	
				19·52		9·82	785	
1967–68	Aramby III	4	15	5·00	III	2·50	200	
	Aramby V	2	15	3·93	III	1·97	158	
	Aramby V	12	13/14	7·20	III	3·60	288	
				16·13		8·07	646	
1968–69	Aramby III	7	15	5·60	III	2·80	224	
	Aramby V	1	15	5·25	III	2·63	210	
	Aramby V	4	15	5·50	III	2·75	220	
	Aramby V	15	15	3·60	III	1·80	144	
				19·95		9·98	798	

Doddabetta Felling Series.

Total area—275·52 acres.
Total reduced area—180·75 acres.

1954–55	Doddabetta	3a	30	15·50	II	11·63	930	Hardwood.
1955–56	Doddabetta	3b	31	15·50	II	11·63	930	Do.
1956–57	Doddabetta	4a	32	14·20	II	10·67	854	Do.
1957–58	Doddabetta	4b	33	14·20	II	10·67	854	Do.
1958–59	Doddabetta	4c	34	14·30	II	10·69	855	Do.
1959–60	Doddabetta	5	15	6·50	III	3·25	260	Bluegum.
	Doddabetta	1	37	11·50	II	8·63	690	Hardwood.
				18·00		11·88	950	
1960–61	Doddabetta	6	15	6·67	III	3·34	267	
	Newman	4	17	2·50	II	1·88	150	
	Newman	6	14/15	3·12	II	2·35	188	
	Newman	7	14/15	2·50	II	1·[illegible]8	150	
	Newman	6	14/15	1·00	II	0·75	60	
				15·80		10·20	815	

Ootacamund North Range—*cont.*

Doddabetta Felling Series—cont.

Year of felling.	*Block and compartment number.*	*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 c ft.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1961–62 ..	.. Doddabetta 7	14/15	8·6	III	4·30	344	1947 regeneration area.
	Newman 9	15	3·87	II	2·90	232	
	Dharmatope 1	17	13·50	III	6·75	540	
			25·97		13·95	1,116	
1962–63 ..	.. Honnathalai 1	15	4·50	III	2·25	180	1947 regeneration area.
	Do. 2	14/15	4·50	III	2·25	180	1948 regeneration area.
	Newman 1	15	2·80	III	1·40	112	
	Do. 2	14/15	3·10	II	2·33	186	
	Do. 3	13	2·90	II	2·18	174	
	Do. 5	15	4·50	III	2·25	180	
			22·30		12·66	1,012	
1963–64 ..	.. Honnathalai 3	14/15	17·42	II	13·07	1,041	1/3rd of 52·26 acres.
1964–65 ..	.. Honnathalai 4	15	17·42	II	13·07	1,041	Do.
1965–66 ..	.. Honnathalai 5	16	17·42	II	13·07	1,041	Do.
1966–67 ..	.. Mynalai ..	15	26·00	III	13·00	1,040	1951 regeneration area.
1967–68 ..	.. Jackundah ..	16	26·00	III	13·00	1,040	Do.
1968–69 ..	.. Doddabetta 2	15	15·50	II	11·63	930	..

Governorshola Felling Series.

Total area—273·82 acres.
Total reduced area—180·41 acres.

Year of felling.	*Block and compartment number.*	*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 c ft.*	*Remarks.*
1954–55 ..	.. Arnaikal VII 1	16	10·50	III	5·25	420	
	Governorshola VI 3b	15	7·50	III	3·75	300	
			18·00		9·00	720	
1955–56 ..	.. Huppatti V 1 and 2	15	25·00	III	12·50	1,000	
1956–57 ..	.. Andy IV 1	16	9·10	III	4·55	364	
	Kulli II 2	15	9·00	II	6·75	540	
			18·10		11·30	904	
1957–58 ..	.. Kulli II 1	16	9·50	I	9·50	760	
	Sheffield III 3	14/15	2·00	II	1·50	120	1943 plantation.
			11·50		11·00	880	
1958–59 ..	.. Sheffield III 1	15	14·80	II	11·10	888	
	Andy IV 4	14	2·00	II	1·50	120	
			16·80		12·60	1,008	
1959–60 ..	.. Chowghat Kulli I 1	15	15·50	II	11·63	930	
1960–61 ..	.. Chowghat Kulli I 2	16	15·00	I	15·00	1,200	
1961–62 ..	.. Chemanguli VIII 1	16	26·50	II	4·88	390	
	Governorshola VI 1	16	12·10	II	9·08	726	
			18·60		13·96	1,116	
1962–63 ..	.. Sheffield III 2	17	15·20	II	11·40	912	
1963–64 ..	.. Chemanguli VIII 2	17	14·00	III	7·00	560	
	Governorshola VI 4	18	11·65	III	5·83	466	
			25·65		12·83	1,026	
1964–65 ..	.. Chemanguli VIII 3	17	11·50	III	5·75	460	
	Governorshola VI 2a	15	6·00	III	3·00	240	
	Governorshola VI 2b	15	5·50	III	2·75	220	
			23·00		11·50	920	

Ootacamund North Range—*cont.*

Govrnorshola Felling Series—cont.

Year of felling.	Block and compartment number.	Age at felling.	Actual area in acres.	Quality.	Area reduced to quality I in acres.	Estimated yield in lots of 120 c.ft.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1965–66 ..	.. Governorshola VI 5	18	11·12	II	8·34	667	
	Andy IV 3	17	9·25	III	4·63	370	
			20·37		12·97	1,037	
1966–67 ..	.. Andy IV 2a	18	10·50	II	7·88	630	
	Governorshola VI 3a	15	5·10	I	5·10	408	
			15·60		12·98	1,038	
1967–68 ..	.. Andy IV 2b	18	16·00	II	12·00	960	
1968–69 ..	.. Hogdson's Hill 1 and 2	15	20·00	III	10·00	800	

Muthinad Felling Series.

Total area—130·83 acres.
Total reduced area—83·65 acres.

Year of felling.	Block and compartment number.	Age at felling.	Actual area in acres.	Quality.	Area reduced to quality I in acres.	Estimated yield in lots of 120 c.ft.	Remarks.
1954–55 ..	.. Brooklands 1	27	5·00	II	3·75	300	Hardwood.
	Muthinad 5a	17	2·15	III	1·08	86	Bluegum.
			7·15		4·83	386	
1955–56 ..	.. Brooklands 2	29	5·00	II	3·75	300	Hardwood.
	Muthinad 5b	18	3·50	III	1·75	140	Bluegum.
			8·50		5·50	440	
1956–57 ..	.. Brooklands 3	28	5·60	II	4·20	336	Hardwood.
	Muthinad 4a	22	3·15	III	1·58	126	Bluegum.
			8·75		5·78	462	
1957–58 ..	.. Brooklands 4	28	5·00	II	3·75	300	Hardwood.
	Muthinad 4b	22	3·21	III	1·61	129	Bluegum.
			8·21		5·36	429	
1958–59 ..	.. Brooklands 5	28	5·80	II	4·35	348	Hardwood.
	Muthinad 4c	..	1·70	III	0·85	68	Bluegum.
			7·50		5·20	416	
1959–60 ..	.. Brooklands 6	28	5·26	III	2·63	210	
	Muthinad 6	36	6·73	III	3·37	270	
			11·99		6·00	480	
1960–61 ..	.. Brooklands 7	28	3·25	III	1·63	130	
	Muthinad 7	16	7·95	III	3·98	319	
			11·20		5·61	449	
1961–62 ..	.. Brooklands 8	28	3·30	II	2·47	198	
	Brooklands 9	27	4·90	III	2·45	196	
			8·20		4 92	394	
1962–63 ..	.. Brooklands 10	27	6·20	II	4·65	372	
1963–64 ..	.. Muthinad 8	15	8·10	II	6·08	486	
1964–65 ..	.. Muthinad 9	18	6·83	II	5·12	410	
1965–66 ..	.. Muthinad 10	19	6·95	I	6·95	556	
1966–67 ..	.. Muthinad 1a	18	3·50	III	1·75	140	
	Muthinad 1b	18	3·50	III	1·75	140	
	Muthinad 2a	15	4·50	II	3·38	270	
			11·50		6·88	550	
1967–68 ..	.. Muthinad 2b	16	3·70	II	2·78	222	
	Muthinad 3a	15	3·15	III	1·58	126	
	Muthinad 3b	15	3·70	III	1·85	148	
			10·55		6·21	496	
1968–69 ..	.. Brooklands (Lascelles). 11	15	9·20	III	4·6	368	

Ootacamund North Range—*cont.*

Snowdon Felling Series.

Total area—188·30 acres.
Reduced area—138·58 acres.

Year of felling.	*Block and compartment number.*		*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yi ld in lots of of 120 c.ft.*	*Remarks.*
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
1954–55 ..	Snowdon II	3	16	8·50	II	6·38	510	
	Snowdon II	8b	15	2·50	I	2·50	200	
				11 00		8·88	710	
1955–56 ..	Snowdon II	4	15	17·80	III	8·90	712	
1956–57 ..	Snowdon II	6a	15	8·00	I	8·00	640	
1957–58 ..	Snowdon II	6b	16	8·00	I	8·00	640	
1958–59 ..	Snowdon II	6c	17	8·00	I	8·00	640	
1959–60 ..	Marliamund III	2a	15	3·70	II	2·78	222	
	Marliamund III	2b	15	4·50	II	3·38	271	
	Marliamund III	3	17	4·20	II	3·15	252	
				12·40		9·31	745	
1960–61 ..	Snowdon II	5a	17	9·00	I	9·00	720	
1961–62 ..	Snowdon II	5b	18	12·00	I	12·00	960	
1962–63 ..	Marliamund III	1	18	6·30	II	4·72	378	
	Snowdon I	7	20	4·50	II	3·38	270	
				10·80		8·10	648	
1963–64 ..	Snowdon I	3	20	4·60	II	3·45	276	
	Snowdon I	8	21	4·60	II	3·45	276	
	Snowdon II	1	15	4·50	III	2·25	180	
				13·70		9·15	732	
1964–65 ..	Snowdon I	4	14	6·90	II	5·15	412	
	Marliamund III	5	18	9·40	III	4·70	376	
				16·30		9·85	788	
1965–66 ..	Snowdon I	1	14	4·20	II	3·18	254	
	Snowdon I	5	15	7·60	II	5·70	456	
				11·80		8·88	710	
1966–67 ..	Snowdon I	2a	15	3·20	II	2·40	192	
	Snowdon II	2	14	16·20	III	8·10	648	
				19·40		10·50	840	
1967–68 ..	Snowdon I	2b	16	3·20	II	2·40	192	
	Snowdon I	6	14	6·40	II	4·80	384	
	Snowdon I	9	14	5·10	II	3·82	306	
				14·70		11·02	882	
1968–69 ..	Snowdon II	8a	15	2·60	I	2·60	208	
	Marliamund III	4	15	12·80	III	6·40	512	
				15·40		9·00	720	

Ootacamund South Range.

Cairnhill Felling Series.

Total area—268·80 acres.
Total reduced area—190·92 acres.

1954–55 ..	Cairnhill II	13	15	5·25	II	3·94	315	
	Baikie IV	4	16	7·50	III	3·75	300	
	Baikie IV	5	16	8·50	III	4·25	340	
				21·25		1.194	955	
1955–56 ..	Cairnhill II	14	15	3·40	II	2·55	204	
	Cairnhill II	15	16	5·35	III	4·01	321	
	Baikie IV	3	15	13·00	III	6·50	520	
				21·75		13·06	1,044	
1956–57 ..	Cairnhill II	1	15	4·28	I	4·28	342	
	Cairnhill II	2	15	5·30	I	5·30	424	
	Baikie IV	1	14/15	8·70	III	4·35	348	
				18·28		13·93	1,114	

Ootacamund South Range—*cont.*

Cairnhill Felling Series—cont.

Year of felling.	*Block and compartment number.*		*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated Yield in lots of 120 c.ft.*	*Remarks.*
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
1957–58 ..	Cairnhill II	7	14/15	6·00	I	6·00	480	
	Cairnhill II	8	16	5·20	I	5·20	416	
	Cairnhill II	10	15	2·50	II	1·88	150	
				13·70		13·08	1,046	
1958–59 ..	Cairnhill I	3	15	8·15	I	8·15	652	
	Cairnhill II	20	15	3·75	II	2·81	225	
				11·90		10·96	877	
1959–60 ..	Elkhill	1	16	15·00	II	11·25	900	1943 R.A.
	Cairnhill addition	1	16	3·00	II	2·25	180	1943 R.A.
				18·00		13·50	1,080	
1960–61 ..	Cairnhill II	6	16	5·00	I	5·00	400	
	Baikie IV	2	16	12·80	III	6·40	512	
				17·80		11·40	912	
1961–62 ..	Cairnhill I	9b-1	17	2·50	I	2·50	200	
	Cairnhill I	9b-2	17	2·75	I	2·75	220	
	Cairnhill II	9	17	4·45	II	3·34	267	
	Cairnhill II	21	17	3·50	II	2·63	210	
				13·20		11·22	897	
1962–63 ..	Cairnhill I	4a-1	16/18	3·13	II	2·35	188	
	Cairnhill I	4a-2	15	2·90	I	2·90	232	
	Cairnhill I	4a-3	15	3·23	I	3·23	258	
	Cairnhill II	18	17	6·45	II	4·84	387	
				15·71		13·32	1,065	
1963–64 ..	Cairnhill II	5	16	7·25	III	3·63	290	
	Cairnhill II	17	16	3·50	II	2·63	210	
	Baikie IV	8	15	12·15	III	6·08	487	
				22·90		12·34	987	
1964–65 ..	Cairnhill II	3	15	5·05	III	2·53	162	
	Cairnhill II	16	15	2·70	II	2·02	162	
	Cairnhill II	19	15	8·20	II	6·15	492	
	Fairlawns	1	15	2·00	II	1·50	120	1948–50 R.A.
				17·95		11·70	936	
1965–66 ..	Fairlawns	2	16	3·00	II	2·25	180	1948–50 R.A.
	Fairlawns	3	16	2·00	II	1·50	120	1949 R.A.
	Fairlawns	4	15	2·00	II	1·50	120	1950 R.A.
	Cairnhill addition	2	15	3·00	II	2·25	180	1950 R.A.
	Cairnhill I	4a-4	15	8·03	II	6·02	482	
				18·03		13·52	1,082	
1966–67 ..	Cairnhill III	1	14	4·50	II	3·38	270	
	Baikie IV	6	14	12·00	II	9·00	720	
				16·50		12·38	990	
1967–68 ..	Baikie IV	7	15	13·00	II	9·75	780	
	Cairnhill II	4	16	7·73	II	3·87	309	
				20·73		13·62	1,089	
1968–69 ..	Cairnhill II	11	15	5·35	III	2·68	214	
	Cairnhill II	12	15	4·75	II	3·56	285	
	Cairnhill III	2	15	6·00	III	3·00	240	Excluding 1 square chain.
	Fairlawns	5	16	7·00	II	5·22	418	Eucalyptus maculta plot.
				23·10		14·46	1,157	

Ootacamund South Range—*cont.*

Ketti Felling Series.

Total area—94·40 acres.
Total Reduced area—69·60 acres.

Year of felling.		*Block and compartment number.*		*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 c.ft.*	*Remarks.*
(1)		(2)		(3)	(4)	(5)	(6)	(7)	(8)
1954–55	..	Ketti	9	41	4·10	II	3·08	246	Hardwood.
1955–56	..	Ketti	8	42	4·10	II	3·08	246	Do.
1956–57	..	Ketti	7	43	4·10	II	3·08	246	Do.
1957–58	..	Ketti	6	45	3·70	II	2·78	222	Do.
		Ketti	5	45	3·90	II	2·94	235	
					7·60		5·72	457	
1958–59	..	Ketti	4	45	3·60	II	2·70	216	Hardwood.
		Ketti	3	15	4·80	III	2·40	192	Bluegum.
					8·40		5·10	408	
1959–60	..	Ketti	2	46	3·90	II	2·94	235	Hardwood.
		Ketti	1	46	4·30	II	3·23	258	Do.
					8·20		6·17	493	
1960–61	..	Ketti	11	15	7·50	II	5·63	450	1945 R.A. (Half).
1961–62	..	Ketti	12	16	7·50	II	5·63	450	Do.
1962–63	..	Katti	10	..	4·90	II	3·68	294	Mixed plantation.
1963–64	..	Lovedale	1	13/14	8·00	II	6·00	480	1950 R.A.
1964–65	..	Ketti	13	14/15	5·00	II	3·75	300	1950 R.A. (Half).
1965–66	..	Ketti	14	15	5·00	II	3·75	300	
		Lovedale	2	15	2·00	II	1·50	120	
					7·00		5·25	420	
1966–67	..	Lovedale	3	15	6·00	II	4·50	360	1951 R.A. (one-third).
1967–68	..	Lovedale	4	16	6·00	II	4·50	360	Do.
1968–69	..	Lovedale	5	17	6·00	II	4·50	360	Do.

Coonoor Range.

Bandyshola Felling Series.

Total area—197·14 acres.
Total reduced area—135·83 acres.

1954–55	..	Springfield	2	26	5·30	II	3·98	318	Hardwoods.
		Springfield	3	26	5·80	II	4·35	348	Do.
					11·10		8·33	666	
1955–56	..	Bandyshola	19	17	3·80	III	1·90	152	
		Bandyshola	28	29	5·80	II	4·35	348	Hardwoods.
		Bandyshola	29	28	2·40	II	1·80	144	Do.
					12·00		8·05	644	
1956–57	..	Bandyshola	7	31	1·80	II	1·35	108	Hardwoods.
		Bandyshola	9	32	3·20	II	2·40	192	Do.
		Bandyshola	18	17	1·80	II	1·35	108	
		Bandyshola	21	16	4·30	III	2·15	172	
					15·30		7·25	580	
1957–58	..	Bandyshola	8	33	6·00	II	4·50	360	
		Bandyshola	24	16	5·63	II	2·82	225	
		Bandyshola	30	30	3·20	II	2·40	192	Hardwoods.
					14·83		9·72	777	
1958–59	..	Bleakhouse	10	16	5·35	III	2·68	214	
		Bandyshola	5	33	1·80	II	1·35	108	
		Bandyshola	6	33	2·90	II	2·23	178	Hardwoods.
		Bandyshola	15	15	3·38	II	2·54	204	Do.
		Bandyshola	16	16	1·80	III	0·90	72	
					15·23		9·70	776	
1959–60	..	Tent Hill	1	15	7·25	III	3·63	290	
		Bleakhouse	2	29	6·40	II	4·80	384	Hardwoods.
					14·65		9·43	674	

Coonoor Range—*cont.*

Bandishola Felling Series—cont.

Total area—197·14 acres.
Total reduced area—136·83 acres.

Year of felling.	*Block and compartment number.*		*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 c.ft.*	*Remarks.*
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
1960–61 ..	Tiger Hill	1	16	11·35	III	5·68	454	
	Bleakhouse	3	30	6·20	II	4·65	372	Hardwoods.
				17·55		10·33	826	
1961–62 ..	Ghat Reserve	1	19	3·20	III	1·60	128	
	Bleakhouse	4	28	4·40	II	3·30	264	Hardwoods.
	Bleakhouse	5	27	5·40	II	4·05	324	Do.
				13·00		8·95	716	
1962–63 ..	Bandyshola	10	15	4·03	II	3·02	242	
	Bandyshola	20	22	4·25	II	3·19	255	
	Bandyshola	22	..	2·00	III	1·00	80	
	Bandyshola	23	21	2·00	II	1·50	120	
				12·28		8·71	697	
1963–64	Bleakhouse	6	26	5·70	II	4·28	342	Hardwoods.
	Bleakhouse	7	25	4·80	II	3·60	288	Do.
	Bleakhouse	8	25	4·60	II	3·45	276	Do.
				15·10		11·33	906	
1964–65	Bleakhouse	9	27	4·60	II	3·45	276	Hardwoods.
	Bandyshola	11	16	2·63	II	1·97	158	
	Bandyshola	12	16	3·25	II	2·44	195	
				10·48		7·86	629	
1965–66 ..	Springfield	4	15	5·80	II	4·34	347	
	Springfield	5	15	5·75	II	4·32	346	
				11·55		8·66	693	
1966–67	Springfield	1	15	5·30	II	3·98	318	
	Bandyshola	1	15	3·55	II	2·66	213	
	Bandyshola	13	15	1·62	II	1·32	98	
	Bandyshola	14	15	1·50	II	1·13	90	
	Bandyshola	17	15	1·60	III	0·80	64	
				13·57		9·79	783	
1967–68	Bandyshola	2	15	1·90	II	1·43	114	
	Bleakhouse	1	14/15	7·60	II	5·70	456	
	Bandyshola	25	14/15	2·70	II	2·00	160	
				12·20		9·13	730	
1968–69	Bandyshola	3	15	3·40	II	2·55	204	
	Bandyshola	4	15	3·60	II	2·70	216	
	Bandyshola	26	15	2·80	II	2·10	168	
	Bandyshola	27	15	1·90	II	1·43	114	
				11·70		8·78	702	

Blackbridge Felling Series.

Total area—172·37 acres.
Total reduced area—86·19 acres.

1954–55	Teppakuchi	1	22 to 29	15·05	III	7·53	602	
1955–56	Teppakuchi	2	22 to 25	10·20	III	5·10	408	
1956–57	Teppakuchi	3	21	5·37	III	2·69	205	
	Blackbridge	6	14/15	5·00	III	2·50	200	1942–43 R.A.
				10·37		5·19	405	
1957–58	Blackbridge	7	15	10·00	III	5·00	400	1942–43 R.A.
1958–59	Blackbridge	8	15	10·00	III	5·00	400	1943–44 R.A. (one-fifth).
1959–60	Blackbridge	9	16	10·00	III	5·00	400	Do.
1960–61	Blackbridge	10	17	10·00	III	5·00	400	Do.
1961–62	Blackbridge	11	18	10·00	III	5·00	400	Do.
1962–63	Blackbridge	12	19	10·00	III	5·00	400	Do.
1963–64	Blackbridge	13	19	10·00	III	5·00	400	1944–45 R.A.
1964–65	Blackbridge	14	19	5·02	III	2·51	201	1945–46 R.A.
	Blackbridge	1	19	8·20	III	4·10	328	
				13·22		6·61	529	

Coonoor Range—*cont.*

Blackbridge Felling Series—cont.

Year of felling.	*Block and compartment number.*	*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 c.ft.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1965–66 ..	.. Blackbridge 3	17	9·75	III	4·88	390	
	Blackbridge 15	14/15	3·00	III	1·50	120	Plantation raised by lease.
			12·75		6·38	510	
1966–67 ..	.. Blackbridge 2	19	6·38	III	3·19	255	
	Blackbridge 5	14/15	5·45	III	2·73	218	
			11·83		5·92	473	
1967–68 ..	.. Blackbridge 4	17	9·85	III	4·93	394	
	Blackbridge 16	16	2·00	III	1·00	80	Plantation raised by lease.
			11·85		5·93	474	
1968–69 ..	.. Blackbridge 17	16	17·10	III	8·05	644	

Coonoor Peak Felling Series.

Total area—228·74 acres.
Total reduced area—151·41 acres.

Year of felling.	*Block and compartment number.*	*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 c.ft.*	*Remarks.*
1954–55 ..	.. Coonoor Peak I 8	15	4·75	III	2·38	190	
	Coonoor Peak I 4	14/15	6·45	II	4·84	387	
			11·20		7·22	577	
1955–56 ..	.. Coonoor Peak I 12	15	6·30	III	3·15	252	
	Coonoor Peak I 13	15	1·95	III	0·98	78	
	Coonoor Peak I 16	15	3·98	II	2·99	239	
	Coonoor Peak I 17	15	1·60	II	1·20	96	
			13·83		8·32	6·65	
1956–57 ..	.. Coonoor Peak I 14	15	4·00	II	3·00	240	
	Coonoor Peak I 15	15	3·70	II	2·78	222	
	Coonoor Peak I 18	15	5·57	II	4·18	334	
			13.27		9·96	796	
1957–58 ..	.. Coonoor Peak I 22	14/15	7·50	III	3·75	300	
	Coonoor Peak I 24	15	8·35	III	4·18	334	
	Coonoor Peak I 27	14/15	4·75	III	2·38	190	
			20·60		10·31	824	
1958–59 ..	.. Coonoor Peak I 19	14/15	2·00	III	1·00	80	
	Coonoor Peak I 37	14/15	7·60	III	3·80	304	
	Coonoor Peak I 39	14/15	6·50	II	4·88	390	
			16·10		9·68	774	
1959–60 ..	.. Coonoor Peak I 29	14/15	6·62	II	4·97	398	
	Coonoor Peak I 40	15	5·70	II	4·28	342	
			12·32		9·25	740	
1960–61 ..	.. Coonoor Peak I 1	15	8·50	III	4·25	340	
	Coonoor Peak I 23	15	5·10	II	3·83	306	
	Coonoor Peak I 30	15	2·75	II	2·06	165	
			16·35		10·14	811	
1961–62 ..	.. Coonoor Peak I 28	15	4·37	II	3·28	262	
	Coonoor Peak I 31	16	5·20	II	3·90	312	
	Coonoor Peak I 33	15	3·35	II	2·51	201	
			12·92		9·69	775	
1962–63 ..	.. Coonoor Peak I 32	16	5·60	II	4·20	336	
	Coonoor Peak I 34	16	7·38	II	5·54	443	
			12·98		9·74	779	
1963–64 ..	.. Coonoor Peak I 20	15	4·25	II	3·18	254	
	Coonoor Peak I 35	17	6·95	III	3·48	278	
	Coonoor Peak I 36	15	6·00	II	4·50	360	
			17·20		11·16	892	

Coonoor Range—*cont.*

Coonoor Peak Felling Series—cont.

Year of felling.	*Block and compartment number.*			*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 cubic feet.*	*Remarks.*
(1)	(2)			(3)	(4)	(5)	(6)	(7)	(8)
1964–65	Coonoor Peak	I	6	14/15	6·45	III	3·23	258	
	Coonoor Peak	I	21	15	3·75	III	1·88	150	
	Coonoor Peak	I	25	15	5·75	II	4·31	345	
	Coonoor Peak	I	26	14/15	3·75	III	1·88	150	
					19·70		11·30	903	
1965–66	Teneriffee Peak	II	2a	15	3·65	I	3·65	292	
	Teneriffee Peak	II	2b	15	4·25	I	4·25	340	
	Teneriffee Peak	II	2c	15	3·65	I	3·65	292	
					11·55		11·55	924	
1966–67	Coonoor Peak	I	7	15	2·50	II	1·88	150	
	Coonoor Peak	I	9	15	6·50	III	3·25	260	
	Coonoor Peak	I	11	15	6·40	III	3·20	256	
	Coonoor Peak	I	38	15	4·75	II	3·31	265	
					20·15		11·64	931	
1967–68	Coonoor Peak	I	3	14/15	7·42	II	5·57	445	
	Coonoor Peak	I	5	16	5·75	II	4·31	345	
					13·17		9·88	790	
1968–69	Coonoor Peak	I	2	16	7·42	III	3·71	297	
	Coonoor Peak	I	10	16	6·00	I	6·00	480	
					13·42		9·71	777	

Rallia Felling Series.

Total area—150·01 acres.
Total reduced area—87·02 acres.

NOTE.—There will be no fellings in this series from 1954–55 to 1957–58.

1958–59	Rallia	1	15	2·50	II	1·88	150	
	Rallia	11	24	8·63	III	4·32	345	
				11·13		6·20	496	
1959–60	Rallia	2-b	15	7·25	III	3·63	290	
	Rallia	8	15	3·25	III	1·63	130	
				10·50		5·26	420	
1960–61	Naduthatti	1	15	10·00	III	5·00	400	
1961–62	Rallia	2-a	16	7·25	III	3·63	290	
	Rallia	9	14/15	2·50	III	1·25	100	
				9·75		4·88	390	
1962–63	Little Rallia	1	14/15	5·25	II	3·94	315	
	Little Rallia	2	14/15	2·75	II	1·82	146	
				8·00		5·76	461	
1963–64	Rallia	4	14/15	2·88	II	2·16	173	
	Longwood	1	14/15	5·60	III	2·80	224	
				8·48		4·96	397	
1964–65	Little Rallia	3	15	2·50	II	1·88	150	
	Rallia	13a	14/15	7·00	III	3·50	280	
				9·50		5·38	430	
1965–66	Sullicode	1	15	14·00	III	7·00	560	
1966–67	Rallia	5	14/15	2·75	II	2·38	190	
	Rallia	10	15	2·00	III	1·00	80	
	Sullicode	2	15	5·50	III	2·75	220	
				10·25		6·13	490	

Coonoor Range—*cont.*

Rallia Felling Series—cont.

Year of felling.	*Block and compartment number.*		*Age at felling.*	*Actual area in acres.*	*Quality.*	*Area reduced to quality I in acres.*	*Estimated yield in lots of 120 cubic feet.*	*Remarks.*
(1)	(2)		(3)	(4)	(5)	(6)	(7)	(8)
1967–68	Sullicode	3	16	6·00	III	3·00	240	
	Rallia	3	15	3·50	I	3·50	280	
				9·50		6·50	520	
1968–69	Rallia	14b	16	8·60	II	6·45	516	
1969–70	Rallia	13b	16	7·90	II	5·92	473	
1970–71	Rallia	14-a	17	8·70	II	6·53	522	
1971–72	Rallia	6	17	2·75	III	1·38	110	
	Rallia	15-a	17	9·00	III	4·50	360	
				11·75		5·88	470	
1972–73	Rallia	7	18	2·75	III	1·38	110	
	Rallia	15-b	18	9·20	III	4·60	368	
				11·95		5·98	478	

346. The following statements furnished in respect of each felling series the total annual out for each year:—

Ootacamund North Range.

Actual area in acres.

Year.	*Aramby felling series.*	*Doddabetta felling series.*	*Governor shola felling series.*	*Muthinad felling series.*	*Snowdon felliing series.*	*Total.*
1954–55	17·22	15·50	18·00	7·15	11·00	68·87
1955–56	18·65	15·50	25·00	8·50	17·80	85·45
1956–57	17·75	14·20	18·10	8·75	8·00	66·80
1957–58	19·10	14·20	11·50	8·21	8·00	61·01
1958–59	19·03	14·30	16·80	7·50	8·00	65·63
1959–60	18·70	18·00	15·50	11·69	12·40	76·29
1960–61	21·60	15·80	15·00	11·20	9·00	72·60
1961–62	21·94	25·97	18·60	8·20	12·00	86·71
1962–63	21·32	22·30	15·20	6·20	10·80	75·82
1963–64	19·85	17·42	25·65	8·10	13·70	82·72
1964–65	16·64	17·42	23·00	6·83	16·30	80·19
1965–66	17·10	17·42	20·37	6·95	11·80	73·64
1966–67	19·52	26·00	15·60	11·50	19·40	92·02
1967–68	16·13	26·00	16·00	10·55	14·70	83·08
1968–69	19·95	15·50	20·00	9·20	15·40	80·05

Ootacaumand South Range.

Actual area in acres.

Year.	*Cairnhill felling series.*	*Ketti. felling series.*	*Total.*
1954–55	21·25	4·10	25·35
1955–56	21·75	4·10	25·85
1956–57	18·28	4·10	22·38
1957–58	13·70	7·60	21·30
1958–59	11·90	8·40	20·30
1959–60	18·00	8·20	26·20
1960–61	17·80	7·50	25·30
1961–62	13·20	7·50	20·70
1962–63	15·71	4·90	20·61
1963–64	22·90	8·00	30·90
1964–65	17·95	5·00	22·95
1965–66	18·03	7·00	25·03
1966–67	16·50	6·00	22·50
1967–68	20·73	6·00	26·73
1968–69	23·10	6·00	29·10

Coonoor Range.

Actual area in acres.

Year.	*Bandyshola felling series.*	*Blackbridge felling series.*	*Coonoor Peak felling series.*	*Rallia felling series.*	*Total.*
1954–55	11·10	15·05	11·20	..	37·35
1955–56	12·00	10·20	13·83	..	36·03
1956–57	11·10	10·37	13·27	..	34·74
1957–58	14·83	10·00	20·60	..	45·43
1958–59	15·23	10·00	16·10	11·13	52·46
1959–60	14·65	10·00	12·32	10·50	47·47
1960–61	17·55	10·00	16·35	10·00	53·90
1961–62	13·00	10·00	12·92	9·75	45·67
1962–63	12·28	10·00	12·98	8·00	43·26
1963–64	15·10	10·00	17·20	8·48	50·78
1964–65	10·48	13·22	19·70	9·50	52·90
1965–66	11·55	12·75	11·55	14·00	49·85
1966–67	13·57	11·83	20·15	10·25	55·80
1967–68	12·20	11·85	13·17	9·50	46·72
1968–69	11·70	17·10	13·42	8·60	50·82

Section 7—Regulation of Regeneration operations.

347. Areas containing species other than bluegum which are included in this working circle, will be planted with blue gum after they are clearfelled. Blue gum areas felled under this plan, will be completely replanted with blue gum, only when they have completed four coppice rotations. In other cases regeneration by coppice will be depended upon. In all cases the planting or replanting will be done in the year following the clear-felling. It has been stated in paragraph 290 of this plan, that there is an appreciable and progressive fall in the outturn of firewood in the same blue gum plantation at successive fellings. The fall during the fourth rotation is as much as twenty per cent of the potential yield of the area. The expense of replanting will compensate the loss in production during the fifth rotation, even when compared with the capitalized value of the planting costs at compound interest at 3½ per cent for the rotation period of 15 years. It would not be advantageous to undertake replanting earlier than the end of the fourth rotation at the present level of planting costs. Apart from financial considerations, the replanting of the area, at least, once in four rotations is essential, in order that the productivity of the area in question, may not progressively fall. Hence it is prescribed that all areas which have completed four rotations, will be replanted with blue gum in the year following the felling.

348. The following statement shows the areas to be planted or replanted with blue gum, including the fresh areas to be afforested with blue gum :—

PLANTING PROGRAMME.

Year of planting.	Block and compartment.	Area in acres.	Total for each year.
	Ootacamund North Range.		
			ACS.
1954	Aramby III—7	5·60	
	Aramby V—1	5·25	
	Aramby V—4	5·50	
	Aramby V—15	3·60	
	Doddabetta 2	15·50	
	Hogdson's Hill 1 and 2	20·00	
	Brooklands 11 (Lascelles)	9·20	
	Glenmorgan 1	15·00	
	Marliamaund III—4	12·80	
			92·45
1955	Aramby II—5	3·17	
	Aramby V—3	6·30	
	Aramby V—6	7·75	
	Doddabetta 3-a	15·50	
	Glenmorgan 2	15·00	
	Aranaikal VII—1	10·50	
	Brooklands 1	5·00	
	Muthinad 5-a	2·15	
			65·37
1956	Aramby II—6	2·50	
	Aramby III—8	10·50	
	Doddabetta 3-b	15·50	
	Glenmorgan 3	15·00	
	Brooklands 2	5·00	
	Muthinad 5-b	3·50	
			52·00
1957	Aramby II—7	2·00	
	Aramby III—9	11·50	
	Doddabetta 4-a	14·20	
	Glenmorgan 4	15·00	
	Kulli II—2	9·00	
	Brooklands 3	5·60	
	Muthinad 4-a	3·15	
			60·45
1958	Aramby III—2	9·50	
	Dodabetta 4 b	14·20	
	Glenmorgan 5	15·00	
	Kulli II—1	9·50	
	Brooklands 4	5·00	
	Muthinad 4-b	3·21	
			56·41
1959	Doddabetta 4-c	14·30	
	Glenmorgan 6	15·00	
	Brooklands 5	5·80	
	Muthinad 4-c	1·70	
			36·80

Year of planting.	Block and compartment.	Area in acres.	Total for each year.
			ACS.
	Ootacamund North Range—cont.		
1960	Doddabetta 1	11·50	
	Doddabetta 5	6·50	
	Glenmorgan 7	15·00	
	Muthinad 6	6·73	
	Marliamund III—2 b	4·50	
			44·23
1961	Doddabetta 6	6·67	
	Newman 4	2·50	
	Newman 6	3·13	
	Newman 7	2·50	
	Newman 8	1·00	
	Glenmorgan 8	15·00	
			30·80
1962	Aramby II—16	4·14	
	Aramby V—14	4·90	
	Aramby V—17-a	4·80	
	Newman 9	3·87	
	Glenmorgan 9	15·00	
			32·71
1963	Aramby II—15	2·50	
	Aramby III—10	4·55	
	Aramby II—8	2·12	
	Newman 2	3·10	
	Glenmorgan 10	15·00	
	Marliamund III—1	6·30	
			33·57
1964	Glenmorgan 11	15·00	
	Chemanguli VIII—2	14·00	
	Muthinad 8	8·10	
			37·10
1965	Aramby II—13	2·27	
	Aramby II—18	8·50	
	Aramby V—9	3·12	
	Glenmorgan 12	15·00	
	Muthinad 9	6·83	
	Marliamund III—5	9·40	
			45·12
1966	Aramby III—3	4·60	
	Glenmorgan 13	15·00	
	Muthinad 10	6·95	
			26·55
1967	Aramby V—7	5·50	
	Aramby V—8	6·25	
	Glenmorgan 14	15·00	
	Muthinad 1-a	3·50	
	Muthinad 1-b	3·50	
	Muthinad 2-a	4·50	
			38·25
1968	Aramby V—2	3·93	
	Aramby V—12	7·20	
	Glenmorgan 15	15·00	
	Muthinad 2-b	3·70	
	Muthinad 3-a	3·15	
	Muthinad 3-b	3·70	
			36·68
	Ootacamund South Range.		
1954	Cairnhill II—11	5·35	
	Cairnhill II—12	4·75	
	Cairnhill III—2	6·00	16·10
1955	Ketti 9	4·10	4·10
1956	Cairnhill II—14	3·40	
	Ketti 8	4·10	7·50
1957	Baikie IV—1	8·70	
	Cairnhill II—1	4·28	
	Cairnhill II—2	5·30	
	Ketti 7	4·10	
			22·38

Year of planting.	Block and compartment.	Area in acres.	Total for eac. year.
	Ootacamund South Range—cont.		ACS.
1958	Cairnhill II—7	6·00	
	Cairnhill II—8	5·20	
	Cairnhill II—10	2·50	
	Ketti 5	3·90	
	Ketti 6	3·70	
			21·30
1959	Cairnhill II—20	3·75	
	Ketti 4	3·60	
			7·35
1960	Ketti 1	4·30	
	Ketti 2	3·90	
			8·20
1961	Nil	Nil.	Nil.
1962	Cairnhill II—21	3·50	3·50
1963	Cairnhill II—18	6·45	
	Ketti—10	4·90	
			11·35
1964	Baikie IV—8	12·15	12·15
1965	Cairnhill II—3	5·05	
	Cairnhill II—16	2·70	
	Cairnhill II—19	8·20	
			15·95
1966	Nil	Nil.	Nil.
1967	Baikie IV—6	12·00	12·00
1968	Baikie IV—7	13·00	
	Cairnhill II—4	7·73	
			20·73
	Coonoor Range.		
1954	Bandyshola—3	3·48	
	Bandyshola—4	3·60	
	Bandyshola—26	2·80	
	Bandyshola—27	1·90	
	Coonoor Peak I—2	7·42	
	Coonoor Peak I—10	6·00	
	Rallia—6	2·75	
	Rallia—7	2·75	
			30·62
1955	Springfield—2	5·30	
	Springfield—3	5·80	
	Teppakuchi—1	15·05	
			26·15
1956	Bandyshola—28	5·80	
	Bandyshola—29	2·40	
	Teppakuchi—2	10·20	
	Coonoor Peak I—13	1·95	
	Coonoor Peak I—16	3·98	
	Coonoor Peak I—17	1·60	
			25·93
1957	Bandyshola—7	1·80	
	Bandyshola—9	3·20	
	Teppakuchi—3	5·37	
	Coonoor Peak I—14	4·00	
	Coonoor Peak I—18	5·57	
			19·94
1958	Bandyshola—24	5·63	
	Bandyshola—30	3·20	
	Coonoor Peak I—22	7·50	
	Coonoor Peak I—24	8·35	
	Coonoor Peak I—27	4·75	
			29·43
1959	Bandyshola—5	1·80	
	Bandyshola—6	2·90	
	Coonoor Peak I—19	2·00	
	Coonoor Peak I—37	7·60	
	Rallia—11	8·63	
			22·93
1960	Bleakhouse—2	6·40	
	Coonoor Peak I—40	5·70	
	Rallia—2-b	7·25	
	Rallia—8	3·25	
			22·60
1961	Bleakhouse—3	6·20	6·20

Year of planting.	Block and compartment.	Area in acres.	Total for each year.
	Coonoor Range—cont.		ACS.
1962	Bleakhouse—4	4·40	
	Bleakhouse—5	5·40	
	Rallia—9	2·50	12·30
1963	Bandyshola—10	4·03	
	Bandyshola—22	2·00	
	Bandyshola—23	2·00	
	Coonoor Peak I—34	7·38	
	Little Rallia—1	5·25	
	Little Rallia—2	2·75	23·41
1964	Bleakhouse—6	5·70	
	Bleakhouse—7	4·80	
	Bleakhouse—8	4·60	
	Coonoor Peak I—20	4·25	
	Coonoor Peak I—35	6·95	
	Coonoor Peak I—36	6·00	
	Rallia—4	2·88	35·18
1965	Bleakhouse—9	4·60	
	Bandyshola—11	2·63	
	Bandyshola—12	3·25	
	Blackbridge—1	8·20	
	Coonoor Peak I—6	6·45	
	Coonoor Peak I—21	3·75	
	Coonoor Peak I—25	5·75	
	Coonoor Peak I—26	3·75	
	Little Rallia—3	2·50	
	Rallia—13-a	7·00	47·88
1966	Blackbridge—3	9·75	9·75
1967	Bandyshola—13	1·62	
	Bandyshola—14	1·50	
	Blackbridge—2	6·38	
	Blackbridge—5	5·45	
	Coonoor Peak I—7	2·50	
	Coonoor Peak I—9	6·50	
	Coonoor Peak I—11	6·40	
	Rallia—5	2·75	33·10
1968	Coonoor Peak I—5	5·75	5·75

349. The following abstract gives particulars of the total extent of areas to be planted each year with blue gum in each of the ranges and also for the whole of the division :—

Year.	*Area to be planted with blue gum in acres.*			
	Ootacamund North Range.	*Ootacamund South Range.*	*Coonoor Range.*	*Total for the division.*
1954	92·45	16·10	30·62	139·17
1955	65·37	4·10	26·15	95·62
1956	52·00	7·50	25·93	85·43
1957	60·45	22·38	19·94	102·77
1958	56·41	21·30	29·43	107·14
1959	36·80	7·35	22·93	67·08
1960	42·23	8·20	22·60	73·03
1961	30·80	Nil	6·20	37·00
1962	32·71	3·50	12·30	48·51
1963	33·57	11·35	23·41	68·33
1964	37·10	12·15	35·18	84·43
1965	45·12	15·95	47·88	108·95
1966	26·55	Nil.	9·75	36·30
1967	38·25	12·00	33·10	83·35
1968	36·68	20·73	5·75	68·16

350. The areas referred to in paragraph 348 will be planted in the allotted year with the break of the south-west monsoon. Usually planting will commence in Ootacamund North and South Ranges in the month of May and in Coonoor Range in July. The planting will have to be distributed over a number of rainy days during the monsoon period but in no case should the planting be delayed beyond the 15th of August. Replacement of casualties will be carried out as and when noticed during the early weedings and completed before the end of October.

351. The areas referred to in paragraph 348 will be planted according to the planting programme, but the District Forest Officer may extend the area of planting to other areas not included in the list given in paragraph 348. In many cases the plantations stand amidst grassy patches, and it would be possible to extend the area of planting in the contiguous areas, when a particular compartment is due for replanting. In some cases, areas inside and adjacent to the compartments, which had been excluded in the past due to their swampy nature, have now become fit for extending blue gum to those patches. Wherever it is possible to extend the blue gum in the vicinity of the compartment prescribed for planting in paragraph 348, it may be done at the discretion of the District Forest Officer.

352. The planting operations and the maintenance of the plantations will be done departmentally. Wherever it is possible to get men to cultivate the area with potato, it should be encouraged, because the soil working done for the foodcrop and the residual manure left in the area are helpful in the establishment of a vigorously growing blue gum plantation. All compartments, where the general slope is steeper than 1 in 5, no potato cultivation should be allowed.

353. After clearfelling in the area to be planted with blue gum is completed, it may be leased out for potato cultivation. The lease will be for one year commencing from the 1st January of the year of the blue gum planting. Potato crop will be raised in the area only for one year. Any revenue realized for such lease is only incidental, and in no case potato cultivation should be extended beyond the first year as the frequent turning up of the soil in a short time will lead to serious soil erosion. It is not necessary that the potato grower should remove his crop before planting with blue gum, for planting can be done by the department in the potato area in the pits (at an espacement of 11 feet × 11 feet) kept ready by the lessee.

354. If no one is forthcoming to do potato cultivation in a particular area, the planting up of the area with blue gum should not be postponed; the area will be planted up according to programme, without potato cultivation.

355. The espacement to be adopted for planting blue gum will be 11 feet × 11 feet. Mossed nursery seedlings of blue gum not less than 9 inches high will be planted in pits, one foot cube, dug in the month of April and filled in just before planting takes place. In areas leased out for potato cultivation the lessee will be required to dig the pits, so that planting may be done with the break of the monsoon by the department in the leased out area.

356. Blue gum seeds number about 7,500 to an ounce. The ripe capsules that fall to the ground will be collected, dried for about a week to free the seeds. The burst capsules will be sieved and the seed collected. The existing practice of obtaining seed by purchase from local people may continue.

357. For a standard nursery bed of 40 feet × 4 feet made of good soil mixed with shola earth, four ounces of seed will be used. It is not advisable to sow heavier than 4 oz. per bed as it produces congestion and does not result in proper size of seedlings by the time of planting. The seeds germinate in about a fortnight and the seedlings require to be shaded from the sun. The seedlings are very susceptible to 'drip' and hence the shades should be removed during the rain. When the seedlings are about six inches high, they will be 'mossed', i.e., the seedlings will be taken from the beds with as much earth round the roots as possible and the roots with the earth will be loosely wrapped round with moss and tied with a suitable fibre. The seedlings will be kept in moss, protected against excessive sun and 'drip' till the planting season. When so kept they must be moved once a fortnight to prevent the roots striking through. The fibre binding the moss will be unwound while the seedling is planted.

358. A standard bed of 40 feet × 4 feet will yield about 4,000 plantable seedlings and hence, for a 11 feet × 11 feet espacement, one standard bed will be sufficient for planting eight acres including replacement of casualties. The nursery should be formed about the 15th September annually and all sowings completed by 15th October.

359. Weedings will be done in the first year thrice two feet round the plant, in July, in November and in March. Seedlings which do not attain 18 inches height by the middle of October will be sheltered from frost with covers made of bracken frond or tall grass. Mulching to cover the collar of such plants will be done with the cut weeds in the area. The shades should be removed as soon as the frost season is over, usually towards the end of February. The shades should not be too thick as to exclude light completely. In replanted areas, coppice shoots from the original stools are a serious menace to the planted seedlings. The coppice growth should be cut just before planting takes place, and should be repeated every time weeding takes place, so that they may not smother the planted seedlings.

360. In areas where planting or replanting with blue gum is undertaken, planting of bluegum seedlings six feet apart will also be done along the periphery of the compartment (Vide paragraph 344).

361. In areas where the regeneration is entirely by coppice, no special cultural operations need be normally undertaken. There will be no necessity to thin out the excess coppice shoots, for it has been found that by natural selection only two or three stems per stool establish themselves by the end of two or three years, though initially the stool may throw up a number of coppice shoots. It has also been found that from the point of view of outturn, no significant difference is attained by reducing the stems per stool to one or two. However, it is suggested, if there is demand for Eucalyptus leaves for distillation of oil, the right of removal of the excess coppice shoots may be sold in auction retaining the best three coppice shoots for each stool. Such removal will be carried out in the year succeeding the coppicing and will be done under the direct supervision of a forest subordinate. A lease period not exceeding a month may be fixed.

Section 8—Subsidiary Silvicultural Regulations.

362. No trees for departmental works or for sale on seigniorage rates should be allowed to be removed from the blue gum plantations; if absolutely necessary for departmental works, such removals should be restricted to the plantations to be felled in the succeeding year, and the removal of the selected stems completed before the area is put up for sale.

363. In order to meet the demands of the Eucalyptus oil industry, and incidentally augment the revenue from the blue gum plantations, rotational lopping of the branches will be permitted. Exclusion of a definite length of the crown from lopping so that the rate of growth of the trees may not be interrupted, a rest of five years between each lop and exclusion of lopping in the early stages of the life of the plantation will be the conditions governing the lopping programme so that the physiological balance of individual trees or the sulvicultural requirements of the crop may not be seriously affected.

364. Plantations which are to be lopped will be leased out for a period of three months commencing from 1st November of the year. The sale will be held in September. The lessee will be required to retain all the leaves in the 10 feet of the crown from the top of each tree. He may remove all the leaves from the other parts of the tree, but while removing them branch wood thicker than the size of the thumb should not be cut. Each plantation will be lopped twice in its rotation. One lopping would be in the year preceding the felling of the crop and another five years earlier. When the plantation is sold for clearfelling no separate lease for extraction of leaves will be effected. The purchaser of the standing growth in the coupe may dispose of the leaves from the remnant crown of the previous years' lopping.

365. The following statements furnish details of the blue gum areas to be leased out for lopping in the allotted year :—

Year.	Block and compartment.	Area in acres.	Total for the year.
	Ootacamund North Range.		ACS.
1954-55	Aramby V—5	5·65	
	Aramby II—6	2·50	
	Aramby III—8	10·50	
	Aramby II—3	3·85	
	Aramby III—11	5·25	
	Aramby VII—2 (addition)	12·50	
	Doddabetta—6	6·67	
	Newman—4	2·50	
	Newman—6	3·13	
	Newman—7	2·50	
	Newman—8	1·00	
	Huppatti V—1 and 2	25·00	
	Chowghat Kulli I—2	15·00	
	Muthinad—5-b	3·50	
	Brooklands—7	3·25	
	Muthinad—7	7·95	
	Snowdon II—4	17·80	
	Snowdon II—5-a	9·00	
		——	137·55

Year.	Block and compartment.	Area in acres.	Total for the year.
			ACS.
	Ootacamund North Range—cont.		
1955–56	Aramby II—7	2·00	
	Aramby II—10	4·25	
	Aramby III—9	11·50	
	Aramby II—16	4·14	
	Aramby V—14	4·90	
	Aramby V—17-a	4·80	
	Aramby III—1	5·50	
	Aramby III—12	2·60	
	Doddabetta—7	8·60	
	Newman—9	3·87	
	Dharmatope—1	13·50	
	Andy IV—1	9·10	
	Kulli II—2	9·00	
	Chemmanguli VIII—1	6·50	
	Governorshola VI—1	12·10	
	Muthinad—4-a	3·15	
	Brooklands—8	3·30	
	Brooklands—9	4·90	
	Snowdon II—6-a	8·00	
	Snowdon II—5-b	12·00	
			133·71
1956–57	Aramby VI—7	4·70	
	Aramby VI—8	4·90	
	Aramby III—2	9·50	
	Aramby II—15	2·50	
	Aramby VII—3-b	3·50	
	Aramby VII—3-a	3·25	
	Aramby III—10	4·55	
	Aramby III—6	5·40	
	Aramby II—8	2·12	
	Honnathalai—1	4·50	
	Honnathalai—2	4·50	
	Newman—1	2·80	
	Newman—2	3·10	
	Newman—3	2·90	
	Newman—5	4·50	
	Kulli II—1	9·50	
	Sheffield III—3	2·00	
	Sheffield III—2	15·20	
	Muthinad —4-b	3·21	
	Brooklands—10	6·20	
	Snowdon II—6-b	8·00	
	Snowdon I—7	4·50	
	Marliamund III—1	6·30	
			117·63
1957–58	Aramby V—10	1·00	
	Aramby V—13	3·20	
	Aramby II—12	2·33	
	Aramby II—1	6·50	
	Aramby VII—1	6·00	
	Aramby III—13	10·20	
	Aramby II—9	2·25	
	Aramby II—11	3·50	
	Aramby VII—3-c	3·90	
	Honnathalai—3	17·42	
	Sheffield III—1	14·80	
	Andy IV—4	2·00	
	Chemmanguli VIII—2	14·00	
	Governorshola VI—4	11·65	
	Muthinad—4-c	1·70	
	Muthinad—8	8·10	
	Snowdon II—6-c	8·00	
	Snowdon I—3	4·60	
	Snowdon I—8	4·60	
	Snowdon II—1	4·50	
			130·25

Year.	Block and compartment.	Area in acres.	Total for the year. ACS.
	Ootacamund North Range—cont.		
1958–59	Aramby VII—2	11·00	
	Aramby III—5	2·80	
	Aramby VI—3	4·90	
	Aramby II—13	2·27	
	Aramby II—18	8·50	
	Aramby V—9	3·12	
	Aramby VII—4-a	2·75	
	Doddabetta—5	6·50	
	Honnathalai—4	17·42	
	Chowghat Kulli I—1	15·50	
	Chemmanguli VIII—3	11·50	
	Governorshola VI—2-a	6·00	
	Governorshola VI—2-b	5·50	
	Brooklands—6	5·26	
	Muthinad—6	6·73	
	Muthinad—9	6·83	
	Marliamund III—2-a	3·70	
	Marliamund III—2-b	4·50	
	Marliamund III—3	4·20	
	Marliamund III—5	9·40	
	Snowdon I—4	6·90	145·28
1959–60	Aramby II—3	3·85	
	Aramby III—11	5·25	
	Aramby VII—2 addition	12·50	
	Aramby II—2	3·50	
	Armaby II—4	5·10	
	Aramby III—3	4·60	
	Aramby VII—4-b	3·90	
	Doddabetta—6	6·67	
	Newman—4	2·50	
	Newman—6	3·13	
	Newman—7	2·50	
	Newman—8	1·00	
	Honnathalai—5	17·42	
	Chowghat Kulli I—2	15·00	
	Governorshola VI—5	11·12	
	Andy IV—3	9·25	
	Brooklands—7	3·25	
	Muthinad—7	7·95	
	Muthinad—10	6·95	
	Snowdon II—5-a	9·00	
	Snowdon I—1	4·20	
	Snowdon I—5	7·60	146·24
1960–61	Aramby II—16	4·14	
	Aramby V—14	4·90	
	Aramby V—17-a	4·80	
	Aramby III—1	5·50	
	Aramby III—12	2·60	
	Aramby II—14	2·40	
	Aramby II—17	5·37	
	Aramby V—7	5·50	
	Aramby V—8	6·25	
	Doddabetta—7	8·60	
	Newman—9	3·87	
	Dhammatope—1	13·50	
	Mynalai	26·00	
	Chemmanguli VIII—1	6·50	
	Governorshola VI—1	12·10	
	Andy IV—2-a	10·50	
	Governorshola VI—3-a	5·10	
	Brooklands—8	3·30	
	Brooklands—9	4·90	
	Muthinad—1-a	3·50	
	Muthinad—1-b	3·50	
	Muthinad—2-a	4·50	
	Snowdon II—5-b	12·00	
	Snowdon I—2-a	3·20	
	Snowdon II—2	16·20	178·73

Year.	Block and compartment.	Area in acres.	Total for the year.
			ACS.
	Ootacamund North Range—cont.		
1961–62	Aramby II—15	2·50	
	Aramby VII—3-b	3·50	
	Aramby VII—3-a	3·25	
	Aramby III—10	4·55	
	Aramby III—6	5·40	
	Aramby II—8	2·12	
	Aramby III—4	5·00	
	Aramby V—2	3·93	
	Aramby V—12	7·20	
	Honnathalai—1	4·50	
	Honnathalai—2	4·50	
	Newman—1	2·80	
	Newman—2	3·10	
	Newman—3	2·90	
	Newman—5	4·50	
	Jackundah	26·00	
	Sheffield III—2	15·20	
	Andy IV—2-b	16·00	
	Brooklands—10	6·20	
	Muthinad—2-b	3·70	
	Muthinad—3-a	3·15	
	Muthinad—3-b	3·70	
	Marliamund III—1	6·30	
	Snowdon—1	4·50	
	Snowdon I—2-b	3·20	
	Snowdon I—6	6·40	
	Snowdon I—9	5·10	
			159·20
1962–63	Aramby III—13	10·20	
	Aramby II—9	2·25	
	Aramby II—11	3·50	
	Aramby VIII—3-c	3·90	
	Aramby III—7	5·60	
	Aramby V—1	5·25	
	Aramby V—4	5·50	
	Aramby V—15	3·60	
	Honnathalai—3	17·42	
	Doddabetta—2	15·50	
	Chemmanguli VIII—2	14·00	
	Governorshola VI—4	11·65	
	Hogdson's Hill—1 and 2	20·00	
	Muthinad—8	8·10	
	Brooklands (Lascelles)—11 ..	9·20	
	Snowdon I—3	4·60	
	Snowdon I—8	4·60	
	Snowdon II—1	4·50	
	Snowdon II—8-a	2·60	
	Marlimund III—4	12·80	
			164·77
1963–64	Aramby II—13	2·27	
	Aramby II—18	8·50	
	Aramby V—9	3·12	
	Aramby VII—4-a	2·75	
	Aramby II—5	3·17	
	Aramby V—3	6·30	
	Aramby V—6	7·75	
	Honnathalai—4	17·42	
	Doddabetta—3-a	15·50	
	Glenmorgan—1	15·00	
	Chemmanguli VIII—3	11·50	
	Governorshola VI—2-a	6·00	
	Governorshola VI—2-b	5·50	
	Arnaikal VII—1	10·50	
	Governorshola VI—3-b	7·50	
	Muthinad—9	6·83	
	Brooklands—1	5·00	
	Muthinad—5-a	2·15	
	Snowdon I—4	6·90	
	Marliamund III—5	9·40	
	Snowdon II—3	8·50	
	Snowdon II—8-b	2·50	
			164·06

Year.	Block and compartment.	Area in acres.	Total for the year.
			ACS.
	Ootacamund North Range—cont.		
1964–65	Aramby II—2	3·50	
	Aramby II—4	5·10	
	Aramby III—3	4·60	
	Aramby VII—4-b	3·90	
	Aramby V—5	5·65	
	Aramby II—6	2·50	
	Aramby III—8	10·50	
	Honnathalai—5	17·42	
	Doddabetta—3-b	15·50	
	Glenmorgan—2	15·00	
	Governorshola VI—5	11·12	
	Andy IV—3	9·25	
	Huppatti V—1 and 2	25·00	
	Muthinad—10	6·95	
	Muthinad—5-b	3·50	
	Brooklands—2	5·00	
	Snowdon I—1	4·20	
	Snowdon I—5	7·60	
	Snowdon II—4	17·80	
			174·09
1965–66	Aramby II—14	2·40	
	Aramby II—17	5·37	
	Aramby V—7	5·50	
	Aramby V—8	6·25	
	Aramby II—7	2·00	
	Aramby III—9	11·50	
	Aramby II—10	4·25	
	Mynalai	26·00	
	Doddabetta—4-a	14·20	
	Glenmorgan—3	15·00	
	Andy IV—2-a	10·50	
	Governorshola VI—3-a	5·10	
	Andy IV—1	9·10	
	Kulli II—2	9·00	
	Muthinad—1-a	3·50	
	Muthinad—1-b	3·50	
	Muthinad 2-a	4·50	
	Muthinad—4-a	3·15	
	Brooklands—3	5·60	
	Snowdon I—2-a	3·20	
	Snowdon II—2	16·20	
	Snowdon II—6-a	8·00	
			173·82
1966–67	Aramby III—4	5·00	
	Aramby V—2	3·93	
	Aramby V—12	7·20	
	Aramby VI—7	4·70	
	Aramby VI—8	4·90	
	Aramby III—2	9·50	
	Jakundah	26·00	
	Doddabetta—4-b	14·20	
	Glenmorgan—4	15·00	
	Andy IV—2-b	16·00	
	Kulli II—1	9·50	
	Sheffield III—3	2·00	
	Muthinad—2-b	3·70	
	Muthinad—3-a	3·15	
	Muthinad—3-b	3·70	
	Muthinad—4-b	3·21	
	Brooklands—4	5·00	
	Snowdon I—2-b	3·20	
	Snowdon I—6	6·40	
	Snowdon I—9	5·10	
	Snowdon II—6-b	8·00	
			159·39

Year.	Block and compartment.	Area in acres	Total for the year.
			ACS.
	Ootacamund North Range—cont.		
1967–68	Aramby III—7	5·60	
	Aramby V—1	5·25	
	Aramby V—4	5·50	
	Aramby V—15	3·60	
	Aramby V—10	1·00	
	Aramby V—13	3·20	
	Aramby II—1	6·50	
	Aramby II—12	2·33	
	Aramby VII—1	6·00	
	Doddabetta—2	15·50	
	Doddabetta—4-c	14·30	
	Glenmorgan—5	15·00	
	Hogdson's Hill—1 and 2	20·00	
	Sheffield III—1	14·80	
	Andy IV—4	2·00	
	Brooklands (Lascelles)—11 ..	9·20	
	Brooklands—5	5·80	
	Muthinad—4-c	1·70	
	Snowdon II—8-a	2·60	
	Marliamund III—4	12·80	
	Snowdon II—6-c	8·00	
			160·68
1968–69	Aramby II—5	3·17	
	Aramby V—3	6·30	
	Aramby V—6	7·75	
	Aramby VI—3	4·90	
	Aramby VII—2	11·00	
	Aramby III—5	2·80	
	Doddabetta—3-a	15·50	
	Doddabetta—5	6·50	
	Doddabetta—1	11·50	
	Glenmorgan—1	15·00	
	Glenmorgan—6	15·00	
	Governorshola VI—3-b	7·50	
	Arnaikal VII—1	10·50	
	Chowghat Kulli I—1	15·50	
	Brooklands—1	5·00	
	Muthinad—5-a	2·15	
	Brooklands—6	5·26	
	Muthinad—6	6·73	
	Snowdon II—3	8·50	
	Snowdon II—8-b	2·50	
	Marliamund III—2-a	3·70	
	Marliamund III—2-b	4·50	
	Marliamund III—3	4·20	
			175·46
	Ootacamund South Range.		
1954–55	Cairnhill II—14	3·20	
	Cairnhill II—15	5·35	
	Baikie IV—3	13·00	
	Baikie IV—2	12·80	
	Cairnhill II—6	5·00	
	Ketti—11	7·50	
			47·05
1955–56	Cairnhill II—1	4·28	
	Cairnhill II—2	5·30	
	Baikie IV—1	8·70	
	Cairnhill I—9 b-1	2·50	
	Cairnhill I—9 b-2	2·75	
	Cairnhill II—9	4·45	
	Cairnhill II—21	3·50	
	Ketti—12	7·50	
			38·98

Year.	Block and compartment.	Area in acres.	Total for the year. ACS.
	Ootacamund South Range—cont.		
1956–57	Cairnhill II—7	6·00	
	Cairnhill II—8	5·20	
	Cairnhill II—10	2·50	
	Cairnhill I—4 a-1	3·13	
	Cairnhill I—4 a-2	2·90	
	Cairnhill I—4 a-3	3·23	
	Cairnhill II—18	6·45	
			29·41
1957–58	Cairnhill I—3	8·15	
	Cairnhill II—20	3·75	
	Cairnhill II—5	7·25	
	Cairnhill II—17	3·50	
	Baikie IV—8	12·15	
	Ketti—3	4·80	
	Lovedale—1	8·00	
			47·60
1958–59	Cairnhill Addition—1	3·00	
	Elkhill—1	15·00	
	Cairnhill II—3	5·05	
	Cairnhill II—16	2·70	
	Cairnhill II—19	8·20	
	Fairlawns—1	2·00	
	Ketti—13	5·00	
			40·95
1959–60	Cairnhill II—6	5·00	
	Baikie IV—2	12·80	
	Fairlawns—2	3·00	
	Fairlawns—3	2·00	
	Fairlawns—4	2·00	
	Cairnhill Addition—2	3·00	
	Cairnhill I—4 a-4	8·03	
	Ketti—11	7·50	
	Ketti—14	5·00	
	Lovedale—2	2·00	
			50·33
1960–61	Cairnhill I—9 b-1	2·50	
	Cairnhill I—9 b-2	2·75	
	Cairnhill II—9	4·45	
	Cairnhill II—21	3·50	
	Cairnhill III—1	4·50	
	Baikie IV—6	12·00	
	Ketti—12	7·50	
	Lovedale—3	6·00	
			43·20
1961–62	Cairnhill I—4 a-1	3·13	
	Cairnhill I—4 a-2	2·90	
	Cairnhill I—4 a-3	3·23	
	Cairnhill II—18	6·45	
	Baikie IV—7	13·00	
	Cairnhill II—4	7·73	
	Lovedale—4	6·00	
			42·44
1962–63	Cairnhill II—5	7·25	
	Cairnhill II—17	3·50	
	Baikie IV—8	12·15	
	Cairnhill II—11	5·35	
	Cairnhill II—12	4·75	
	Cairnhill III—2	6·00	
	Fairlawns—5	7·00	
	Lovedale—1	8·00	
	Lovedale—5	6·00	
			60·00

Year.	Block and compartment.	Area in acres.	Total for the year.
			ACS.
	Ootacamund South Range—cont.		
1963-64	Cairnhill II—3	5·05	
	Cairnhill II—16	2·70	
	Cairnhill II—19	8·20	
	Fairlawns—1	2·00	
	Cairnhill II—13	5·25	
	Baikie IV—4	7·50	
	Baikie IV—5	8·50	
	Ketti—13	5·00	
	Ketti—9	4·10	
			48·30
1964-65	Fairlawns—2	3·00	
	Fairlawns—3	2·00	
	Fairlawns—4	2·00	
	Cairnhill Addition—2	3·00	
	Cairnhill I—4 a-4	8·03	
	Cairnhill II—14	3·40	
	Cairnhill II—15	5·35	
	Baikie IV—3	13·00	
	Ketti —14	5·00	
	Lovedale—2	2·00	
	Ketti—8	4·10	
			50·88
1965-66	Cairnhill III—1	4·50	
	Baikie IV—6	12·00	
	Cairnhill II—1	4·28	
	Cairnhill II—2	5·30	
	Baikie IV—1	8·70	
	Lovedale—3	6·00	
	Ketti—7	4·10	
			44·88
1966-67	Baikie IV—7	13·00	
	Cairnhill II—4	7·73	
	Cairnhill II—7	6·00	
	Cairnhill II—8	5·20	
	Cairnhill II—10	2·50	
	Lovedale—4	6·00	
	Ketti—6	3·70	
	Ketti—5	3·90	
			48·03
1967-68	Cairnhill II—11	5·35	
	Cairnhill II—12	4·75	
	Cairnhill III—2	6·00	
	Fairlawns—5	7·00	
	Cairnhill I—3	8·15	
	Cairnhill II—20	3·75	
	Lovedale—5	6·00	
	Ketti—4	3·60	
	Ketti—3	4·80	
			49·40
1968-69	Cairnhill II—13	5·25	
	Baikie IV—4	7·50	
	Baikie IV—5	8·50	
	Elkhill—1	15·00	
	Cairnhill Addition—1	3·00	
	Ketti -9	4·10	
	Ketti—2	3·90	
	Ketti—1	4·30	
			51·55

Year.	Block and compartment.	Area in acres.	Total for the year. ACS.
	Coonoor Range.		
1954–55	Bandyshola—19	3·80	
	Tigerhill—1	11·35	
	Teppakuchi—2	10·20	
	Blackbridge—10	10·00	
	Coonoor Peak-I—12	6·30	
	Coonoor Peak I—13	1·95	
	Coonoor Peak I—16	3·98	
	Coonoor Peak I—17	1·60	
	Coonoor Peak I—1	8·50	
	Coonoor Peak I—23	5·10	
	Coonoor Peak I—30	2·75	
	Naduhatti—1	10·00	
			75·53
1955–56	Bandyshola—18	1·80	
	Bandyshola—21	4·30	
	Ghat Reserve—1	3·20	
	Blackbridge—3	5·37	
	Blackbridge—6	5·00	
	Blackbridge—11	10·00	
	Coonoor Peak I—14	4·00	
	Coonoor Peak I—15	3·70	
	Coonoor Peak I—18	5·57	
	Coonoor Peak I—28	4·37	
	Coonoor Peak I—31	5·20	
	Coonoor Peak I—33	3·35	
	Rallia—2-a	7·25	
	Rallia—9	2·50	
			65·61
1956–57	Bandyshola—24	5·63	
	Bandyshola—10	4·03	
	Bandyshola—20	4·25	
	Bandyshola—22	2·00	
	Bandyshola—23	2·00	
	Blackbridge—7	10·00	
	Blackbridge—12	10·00	
	Coonoor Peak I—22	7·50	
	Coonoor Peak I—24	8·35	
	Coonoor Peak I—27	4·75	
	Coonoor Peak I—32	5·60	
	Coonoor Peak I—34	7·38	
	Little Rallia—1	5·25	
	Little Rallia—2	2·75	
			79·49
1957–58	Bleakhouse—10	5·35	
	Bandyshola—15	3·38	
	Bandyshola—16	1·80	
	Blackbridge—8	10·00	
	Blackbridge—13	10·00	
	Coonoor Peak I—19	2·00	
	Coonoor Peak I—37	7·60	
	Coonoor Peak I—39	6·50	
	Coonoor Peak I—20	4·25	
	Coonoor Peak I—35	6·95	
	Coonoor Peak I—36	6·00	
	Rallia—1	2·50	
	Rallia—11	8·63	
	Rallia—4	2·88	
	Longwood—1	5·60	
			83·44

Year.	Block and compartment.	Area in acres.	Total for the year. ACS.
	Coonoor Range—cont.		
1958–59	Tenthill—1	7·25	
	Bandyshola—11	2·63	
	Bandyshola—12	3·25	
	Blackbridge—9	10·00	
	Blackbridge—14	5·02	
	Blackbridge—1	8·20	
	Coonoor Peak I—29	6·62	
	Coonoor Peak I—40	5·70	
	Coonoor Peak I—6	6·45	
	Coonoor Peak I—21	3·75	
	Coonoor Peak I—25	5·75	
	Coonoor Peak I—26	3·75	
	Rallia—2-b	7·25	
	Rallia—8	3·25	
	Rallia—13-a	7·00	
	Little Rallia—3	2·50	
			88·37
1959–60	Tiger Hill—1	11·35	
	Springfield—4	5·80	
	Springfield—5	5·75	
	Blackbridge—10	10·00	
	Blackbridge—3	9·75	
	Blackbridge—15	3·00	
	Coonoor Peak I—1	8·50	
	Coonoor Peak I—23	5·10	
	Coonoor Peak I—30	2·75	
	Taneriffe Peak II—2-a	3·65	
	Taneriffe Peak II—2-b	4·25	
	Taneriffe Peak II—2-c	3·65	
	Naduhatti—1	10·00	
	Sullicode—1	14·00	
			97·55
1960–61	Ghat Reserve—1	3·20	
	Springfield—1	5·30	
	Bandyshola—1	3·55	
	Bandyshola—13	1·62	
	Bandyshola—14	1·50	
	Bandyshola—17	1·60	
	Blackbridge—11	10·00	
	Blackbridge—2	6·38	
	Blackbridge—5	5·45	
	Coonoor Peak I—28	4·37	
	Coonoor Peak I—31	5·20	
	Coonoor Peak I—33	3·35	
	Coonoor Peak I—7	2·50	
	Coonoor Peak I—9	6·50	
	Coonoor Peak I—11	6·40	
	Coonoor Peak I—38	4·75	
	Rallia—2-a	7·25	
	Rallia—9	2·50	
	Rallia—5	2·75	
	Rallia—10	2·00	
	Sullicode—2	5·50	
			91·67
1961–62	Bandyshola—10	4·03	
	Bandyshola—20	4·25	
	Bandyshola—22	2·00	
	Bandyshola—23	2·00	
	Bandyshola—2	1·90	
	Bleakhouse—1	7·60	
	Bandyshola—25	2·70	
	Blackbridge—12	10·00	
	Blackbridge—4	9 85	

Year.	Block and compartment.	Area in acres.	Total for the year. ACS.
	Coonoor Range—cont.		
1961–62	Blackbridge—16	2·00	
	Coonoor Peak I—32	5·60	
	Coonoor Peak I—34	7·38	
	Coonoor Peak I—3	7·42	
	Coonoor Peak I—5	5·75	
	Little Rallia—1	5·25	
	Little Rallia—2	2·75	
	Rallia—3	3·50	
	Sullicode—3	6·00	
		———	89·98
1962–63	Bandyshola—3	3·40	
	Bandyshola—4	3·60	
	Bandyshola—26	2·80	
	Bandyshola—27	1·90	
	Blackbridge—13	10·00	
	Blackbridge—17	17·10	
	Coonoor Peak I—20	4·25	
	Coonoor Peak I—35	6·95	
	Coonoor Peak I—36	6·00	
	Coonoor Peak I—2	7·42	
	Coonoor Peak I—10	6·00	
	Rallia—4	2·88	
	Rallia—14-b	8·60	
	Longwood—1	5·60	
		———	86·50
1963–64	Bandyshola—11	2·63	
	Bandyshola—12	3·25	
	Springfield—2	5·30	
	Springfield—3	5·80	
	Blackbridge—14	5·02	
	Blackbridge—1	8·20	
	Teppakuchi—1	15·05	
	Coonoor Peak I—6	6·45	
	Coonoor Peak I—21	3·75	
	Coonoor Peak I—25	5·75	
	Coonoor Peak I—26	3·75	
	Coonoor Peak I—8	4·75	
	Coonoor Peak I—4	6·45	
	Coonoor Peak I—16	3·98	
	Little Rallia—3	2·50	
	Rallia—13-a	7·00	
	Rallia—13-b	7·90	
		———	97·53
1964–65	Bandyshola—19	3·80	
	Bandyshola—28	5·80	
	Bandyshola—29	2·40	
	Springfield—4	5·80	
	Springfield—5	5·75	
	Blackbridge—3	9·75	
	Blackbridge—15	3·00	
	Teppakuchi—2	10·20	
	Coonoor Peak I—12	6·30	
	Coonoor Peak I—13	1·95	
	Coonoor Peak I—16	3·98	
	Coonoor Peak I—17	1·60	
	Taneriffe Peak II—2-a	3·65	
	Taneriffe Peak II—2-b	4·25	
	Taneriffe Peak II—2-c	3·65	
	Sullicode—1	14·00	
	Rallia—14-a	8·70	
		———	94·58

Year.	Block and compartment.	Area in acres.	Total for the year. ACS.
	Coonoor Range—cont.		
1965–66	Springfield—1	5·30	
	Bandyshola—1	3·55	
	Bandyshola—13	1·62	
	Bandyshola—14	1·50	
	Bandyshola—17	1·60	
	Bandyshola—7	1·80	
	Bandyshola—9	3·20	
	Bandyshola—18	1·80	
	Bandyshola—21	4·30	
	Blackbridge—2	6·38	
	Blackbridge—5	5·45	
	Blackbridge—6	5·00	
	Teppakuchi—3	5·37	
	Coonoor Peak I—7	2·50	
	Coonoor Peak I—9	6·50	
	Coonoor Peak I—11	6·40	
	Coonoor Peak I—38	4·75	
	Coonoor Peak I—14	4·00	
	Coonoor Peak I—15	3·70	
	Coonoor Peak I—18	5·57	
	Rallia—5	2·75	
	Rallia—10	2·00	
	Rallia—6	2·75	
	Rallia—15-a	9·00	
	Sullicode—2	5·50	
			102·29
1966–67	Bandyshola—2	1·90	
	Bandyshola—25	2·75	
	Bandyshola—8	6·00	
	Bandyshola—24	5·63	
	Bandyshola—30	3·20	
	Bleakhouse—1	7·60	
	Blackbridge—4	9·85	
	Blackbridge—16	2·00	
	Blackbridge—7	10·00	
	Coonoor Peak I—3	7·42	
	Coonoor Peak I—5	5·75	
	Coonoor Peak I—22	7·50	
	Coonoor Peak I—24	8·35	
	Coonoor Peak I—27	4·75	
	Sullicode—3	6·00	
	Rallia—3	3·50	
	Rallia—7	2·75	
	Rallia—15-b	9·20	
			104·10
1967–68	Bandyshola—3	3·40	
	Bandyshola—4	3·60	
	Bandyshola—26	2·80	
	Bandyshola—27	1·90	
	Bandyshola—5	1·80	
	Bandyshola—6	2·90	
	Bandyshola—15	3·38	
	Bandyshola—16	1·80	
	Bleakhouse—10	5·35	
	Blackbridge—17	17·10	
	Blackbridge—8	10·00	
	Coonoor Peak I—2	7·42	
	Coonoor Peak I—10	6·00	
	Coonoor Peak I—19	2·00	
	Coonoor Peak I—37	7·60	
	Coonoor Peak I—39	6·50	
	Rallia—14-b	8·60	
	Rallia—2-b	7·25	
	Rallia—8	3·25	
			102·65

Year.	Block and compartment.	Area in acres.	Total for the year.
			ACS.
	Coonoor Range—cont.		
1968–69	Springfield—2	5·30	
	Springfield—3	5·80	
	Tenthill—1	7·25	
	Bleakhouse—2	6·40	
	Teppakuchi—1	15·05	
	Blackbridge—9	10·00	
	Coonoor Peak I—8	4·75	
	Coonoor Peak I—4	6·45	
	Coonoor Peak I—16	3·98	
	Coonoor Peak I—29	6·62	
	Coonoor Peak I—40	5·70	
	Rallia—13-b	7·90	
	Rallia—1	2·50	
	Rallia—11	8·63	
			97·33

366. The following statement abstracted from the foregoing details of the programme of rotational loppings furnishes the extent of annual lopping in respect of each range and the whole division :—

Year of lopping.	Area in acres.			
	Ootacamund North Range.	Ootacamund South Range.	Coonoor Range.	Total for the division.
(1)	(2)	(3)	(4)	(5)
	ACS.	ACS.	ACS.	ACS.
1954–55	137·55	47·05	75·53	260·13
1955–56	133·71	38·98	65·61	238·30
1956–57	117·63	29·41	79·49	226·53
1957–58	130·25	47·60	83·44	261·29
1958–59	145·28	40·95	88·37	274·60
1959–60	146·24	50·33	97·55	294·12
1960–61	178·73	43·20	91·67	313·60
1961–62	159·20	42·44	89·98	291·62
1962–63	164·77	60·00	86·50	311·27
1963–64	164·06	48·30	97·53	309·89
1964–65	174·09	50·88	94·58	319·55
1965–66	173·82	44·88	102·29	320·99
1966–67	159·39	48·03	104·10	311·52
1967–68	160·68	49·40	102·65	312·73
1968–69	175·46	51·55	97·33	324·34

Section 9—Other Regulations.

367. *Collection of statistics.*—It is most important that a careful and complete record of the fellings made in the various compartments and the outturn realized from each should be maintained. In addition to recording the outturn in the control book, the yield obtained from each compartment may also be noted in the compartment history (Appendix XII) so that a continuous and complete history of the various compartments may be available.

368. *Renewal of compartment boards.*—The correct maintenance of all compartment boards in the plantations is important and must receive regular attention. The renewal of the compartment boards, which require replacement, will be done annually in the month of April.

369. *Control.*—The control forms which accompany this plan should be posted soon after the close of each financial year.

CHAPTER III.

WORKING PLAN FOR THE WATTLE WORKING CIRCLE.

Section 1—General constitution of the working circle.

370. In order to meet the increasing demand for wattle bark in the tanning industry, a regular and sustained yield of the wattle bark is necessary. Wattle grows well in the Nilgiri plateau, and hence, as large an area as is possible within the limited resources of finance and labour, will have to be brought under wattle in this division. Further, the afforestation of the rolling grassy stretches would help in the conservation of moisture and regulate the flow of water to the different hydro-electric and Irrigation Projects connected with the streams arising from the Nilgiris. Incidentally, apart from the bark, large quantities of wood in compact localities will be made available on a short rotation. A Wattle Working Circle is, therefore, constituted, the principal object of management of the working circle being, the production of the wattle bark from *Acacia mollissima* areas, to meet the keen demand for the produce.

371. The Wattle Working Circle consists of all the new wattle plantations that will be raised during the period of this plan, and among the wattle plantations so far raised in the division, the following :—

Number and name of the plantation.	Year of plantations.	Total area in acres.
1 Mukurti	1950	555·00
2 Do.	1951	355·00
3 Dc.	1952	255·00
4 Do.	1953	272·00
5 Sholur and Lockout	1946 to 1948 ..	185·51
6 Hodgson's Hill (Fields 1 to 3)	1946 and 1947	32·50
7 Ithalar	Do.	21·95
8 Kokothorai	1951 and 1952.	46·00
9 Avaraihalla	1952	18·23
10 Curzon Valley	1952	25·00
11 Doddabetta North	1953	18·80
12 Kodanad (1 and 2)	1947	31·07
13 Kulear	1952	18·75
	Total ..	1,834·81

372. The future extension of wattle plantations will be confined to compact and large blocks near Mukurti and towards Avalanche. Hence, the small and scattered wattle plantations existing at present had not been included in this working circle.

373. The total area of the working circle is 3,434·81 acres, the area already under wattle plantations at present (1953) being 1,834·81 acres. The balance of the area in this working circle will be brought under wattle during the period of this plan.

374. This working circle will be made up of four felling series, of which one will lie in Ootacamund North Range, two in Ootacamund South Range, and the other containing selected plantations situated in the plateau, will be spread over Coonoor, Ootacamund North and Ootacamund South Ranges, though most of the plantations in that series will lie within the limits of Coonoor Range.

375. The following statement gives particulars of the four felling series constituted under this working circle :—

Number and name of the felling series. (1)	Name of the range in which the felling series is situated. (2)	Total area in acres. (3)
1 Sholur	Ootacamund, North	185·51
2 Avalanche	Ootacamund, South	1,160·00
3 Mukurti	Do.	1,837·00
4 Badaganad	Coonoor, Ootacamund North and Ootacamund South.	252·30
	Total ..	3,434·81

376. The Avalanche Series will be made up entirely of the plantations to be raised during the period of this plan. The Mukurti Series includes 1,437·00 acres of plantations already raised and 400·00 acres to be planted. The Sholur Series comprises the plantations already raised at Sholur and Lockout. Except for 40·00 acres of wattle plantation to be raised near the Ithalar plantations during the period of this plan, Badaganad Series includes plantations already raised in the past. When all the series are built up and worked on the basis of a regular and sustained yield, there will be an annual exploitation of about 350 acres and an annual regeneration area of about 350 acres.

Section 2—Blocks and compartments.

377. No division of the area had been made into blocks and compartments so far. At present the wattle plantations are known by the year of the plantations and the locality. However, in future, each of the felling series (except the Badaganad felling Series) that will be built up in accordance with this plan will be divided into ten compartments ; the area to be clearfelled annually during the period of this plan will form a compartment, thereafter the wattle stands will be known by the respective compartment numbers for the purpose

of maintaining the compartment histories. The compartments in the Avalanche Felling Series will constitute Avalanche block, those in the Mukurti Felling Series constitute Mukurti block, and those in the Sholur Felling Series constitute Sholur block. The plantations of Badaganad Felling Series will continue to be known by the name of the locality and the year of the plantation in view of the scattered nature of the plantations. In Mukurti and Avalanche areas where wind belts are raised in the compartment, each wattle stand sandwiched between two wind belts will form a sub-compartment of that compartment.

378. Detailed description of each plantation existing at the time of the preparation of the plan (1953) is given in Appendix XIII. As and when fellings take place compartment histories will be maintained for each compartment, relevant portions of the descriptions of the plantations given in Appendix XIII forming the beginning of the history of each compartment.

379. Detailed maps of the existing plantations and the future set up of each of the series, accompany this plan.

Section 3—Analysis of the crop.

380. The wattle plantations included under this working circle extend over 1,834 acres. Eighty-one acres and the rest of the area under this working circle consists mainly of rolling grasslands. The wattle plantations included in this working circle consist mostly of *Acacia mollissima,* though some of the earlier plantations contain a mixture of *Acacia mollissima* and *Acacia decurrens.* The plantations raised in the last few years contain only *Acacia mollissima.* More than 80 per cent of the existing stock is a pure crop of this species.

381. The distribution of the age gradations in the year 1953 of the existing plantation both in acres and percentage is given below:—

Age in years.	Area in acres.	Percentage of the total area.	Deviation from normal.
(1)	(2)	(3)	(4)
		PER CENT.	PER CENT.
1	290·80	15·85	+ 4·74
2	339·98	18·52	+ 7·41
3	378·00	20·60	+ 9·50
4	555·00	30·24	+ 19·13
5	..	..	— 11·11
6	61·51	3·40	— 7·72
7	121·52	6·59	— 4·53
8	88·00	4·80	— 6·32
9	..	..	— 11·11

382. It will be seen from the preceding statement, that the distribution of the different age gradations is far from normal. One of the main reasons for the uneven distribution of the age gradations is the stepping up of the wattle planting programme during the last four years (1950 onwards) and the conversion of many scattered wattle plantations raised in the past into blue gum, in the recent years. Further there was no systematic planting on a sustained yield basis for want of a working plan. Wattle was planted on an experimental basis during the period of the last plan, and when it was decided to grow wattle on a large scale, it had to be done under periodic schemes sanctioned from time to time, pending the revision of the working plan of the division.

383. However by adopting the scheme of fellings as indicated in this plan and carrying out the future regeneration operations in accordance with the prescriptions contained herein, a regular succession of age gradations will be built up in each series. Thereafter, an annual felling programme of about 350 acres will give a sustained production of about 1,750 tons of bark and about 8,500 tons of wood per annum.

Section 4—Method of treatment.

384. The treatment proposed is (i) to clearfell the wattle stands on a rotation of 9 years (vide paragraphs 387 to 394) for the exploitation of its bark and incidentally utilize its wood to meet the needs of the local or neighbouring population for firewood ; (ii) to plant up the new areas, included in this working circle, with black wattle seedlings, in order to extend the area under wattle ; (iii) to replace with black wattle the areas which now contain green wattle and areas which now contain an admixture of the black wattle and the green wattle ; (iv) to regenerate the areas where the black wattle stands are clearfelled by natural regerneration and (v) to supplement with artificial regeneration in cases where natural regeneration is not successful.

385. *Silvicultural System.*—The silvicultural system adopted will be clearfelling followed by concentrated natural regeneration in all areas where black wattle stands are felled. In other areas concentrated artificial regeneration by planting black wattle seedlings

will be done. In the new areas, where the black wattle is being planted up for the first time, it will be a case of afforestation of grasslands by concentrated artificial regeneration. Once a pure crop of black wattle is established, natural regeneration will be resorted to in those areas when they in their turn are exploited.

386. *Choice of species.*—The black wattle (*Acacia mollissima*) will be the only species used for raising the future wattle plantations. It is the most desired of the wattles for its bark, both on account of its high tannin content (33 to 39 per cent of the bark weight) and the desired finish and colour its extract gives to the leather after tanning. The green wattle (*Acacia decurrens*) also yields a bark with nearly equal tannin content, but unfortunately the proportion of the red and yellow colouring matter in its bark is so high that it produces a tanned leather of a colour not favoured in trade. Hence, all wattle stands containing green wattle or an admixture of both the green and black wattles, will be converted into pure plantations of black wattle. Of the total area of 1,834·81 acres of wattle plantation included in this working circle, more than 80 per cent are already under black wattle and hence, only about 20 per cent of the existing plantations would require conversion into a pure crop of black wattle.

387. *Rotation.*—Since the wattle is grown mainly for the exploitation of its bark, its rotation will be determined mostly by the factors governing the production of bark and the tannin content in the bark. As natural regeneration will have to be depended upon in the succeeding rotations, the conditions necessary for the regeneration as well as the general principles of silviculture, will also be borne in mind while arriving at the suitable rotation for the wattle crop of the locality.

388. The following factors relating to the production of bark will have to be considered. (i) the age at which the bark attains its 'physical' maturity ; (ii) the age at which the rate of production of the bark is the highest ; and (iii) the age at which the tannin content of the bark is the highest.

389. Though the older the tree grows, in virtue of its size, the bark production will be more per tree, it is found that in plantations over ten years of age there is a tendency for the bark to crack. Loss of tannin takes place subsequent to the crack. The bark, when it grows too thick, has a dead outer periderm or 'ross' which does not retain the tannin. Gummosis also sets in when the plantations are allowed to grow beyond ten years. Apart from the cracking of the bark and gummosis, the bark of the wattle trees in plantations over ten years of age, tends to become corky and its value as a tanning material is greatly reduced. Hence, the physical rotation can in no case be beyond ten years in this locality as long as the wattle is grown mainly for its bark.

390. The figures available for the current annual increment and the mean annual increment in respect of the bark outturn (vide paragraph 294) would indicate that the culmination of the mean annual increment takes place between the fifth and the sixth years of the life of a wattle plantation. Hence, basing on the rate of production of the bark, the age at which there is the maximum rate of production per acre would be six years. It should be remembered that the figures relate to crops raised by planting seedlings, and hence in the case of areas where natural regeneration from seeds are resorted to, due allowance for the establishment of the seedlings should be made. So for an average plantation, the rotation based on the rate of maximum bark production will be not less than eight years, bearing in mind that frost is a serious limiting factor in this locality in the establishment of the seedlings.

391. The age at which the tannin content in the bark is at the highest has not been determined with sufficient replications. However, during the course of the preparation of this plan, certain figures were available by the analysis of the bark of various age gradations grown in the Nilgiris. The tannin content was assayed by the Institute of Leather Technology, Madras. The results were plotted on a graph paper and a smooth curve drawn based on the trend of increase or decrease of tannin content with age. The tannin content increases with age up to the sixth year and thereafter falls with the rise in age. The results as read from the graph is given below :—

Age in years.	Percentage of tannin in bark.	Age in years.	Percentage of tannin in bark.
	PER CENT.		PER CENT.
4	37·00	8	36·50
5	38·00	9	34·50
6	38·80	10	33·00
7	38·00		

Based on the age at which the tannin content in the bark is at its highest, it would appear that the wattle may be exploited on a rotation of six years.

392. The age at which the tannin content is at the highest in the bark cannot be in itself the only criterion for fixing the rotation. It has to be correlated to the weight of the bark produced per acre, for in the ultimate analysis it is the age at which the rate of total tannin output per acre is at the highest is of significance. In other words, it is the culmination of the mean annual increment of the total tannin output per acre that will give us an indication of the age at which the crop has to be exploited without sacrifice of tannin production. That is to say, the wattle stands should be exploited, on this consideration, at the age when the value for the expression $(b \times t/100)/a$ is the maximum, where '*b*' stands for the weight of bark produced per acre, '*t*' for the tannin per cent corresponding to the age and '*a*' for the age of the plantation. The value for the expression $(b \times t/100)/a$ for the different ages are given below for the average plantations of wattle (most of the wattle areas would correspond to II/III quality according to the tables given in paragraph 292):—

Number.	'*a*' Age in years.	'*b*' Weight of dry bark per acre in tons.	'*t*' Percentage of tannin content.	$(b \times t/100)$ Weight of total tannin output per acre in tons.	$(b \times t/100)/a$ Mean annual increment of the total tannin output per acre in tons.
(1)	(2)	(3)	(4)	(5)	(6)
(1)	4 ..	2·4	37·00	0·888	0·222
(2)	5 ..	3·4	38·00	1·292	0·258
(3)	6 ..	4·1	38·80	1·591	0·265
(4)	7 ..	4·5	38·00	1·710	0·244
(5)	8 ..	4·9	36·50	1·789	0·224
(6)	9 ..	5·2	34·50	1·794	0·199
(7)	10 ..	5·4	33·00	1·782	0·178

393. As the maximum of the mean annual increment of the total tannin output per acre is at its highest in the sixth year, the rotation at which the wattle stands should be exploited may be fixed for an average plantation at six years. But allowing a period of two years for the facts (i) that the future crops will be of seed origin and by natural regeneration and (ii) that frost is a serious limiting factor in the establishment of the seedlings, the reasonable rotation will be eight years.

394. It would be evident from the foregoing considerations that the rotation cannot be beyond ten years because the value of the bark as a tanning material is greatly reduced in the case of plants grown beyond that age, and that it cannot be below eight years considering both the maximum tannin output per acre and the time required for the establishment of the crop. As it is not advisable to have frequently repeated fellings in the same area, it would appear that the longer rotation of ten years is more suitable taking into account the fundamental silvicultural principles. But, an examination of the figures for the value of $(b \times t/100)$ in the statement given in paragraph 392 would reveal that there is a definite fall in the total output of tannin per acre after the ninth year, because of the decrease in tannin content with age. Therefore, even if we want to grow in view of silvicultural considerations, a little beyond the age at which the rate of production is the highest, it cannot be beyond an age when the total tannin output itself falls. Hence, giving weight to all considerations, the rotation is fixed at nine years.

395. *Regulation of yield.*—The yield will be regulated by area. When all the plantations in each series have been established and the quality of the stand in each unit of the series had been ascertained by recording the average of the dominant heights of the stems before the plantations are clearfelled, it would be possible during the course of the next revision of the plan to adopt areas 'reduced to a common quality' for the purpose of regulating the yield. The regulation for the present will be by actual areas, and the distribution of the annual cuttings will be made according to the rotation fixed above (vide paragraphs 387 to 394) allotting more or less equal areas for each year.

396. The yield expected to be realized annually from each of the felling series during the first fifteen years commencing from the beginning of this plan is shown in the statement given below. Most of the plantations are very young to make any reliable forecast of the yield. However an attempt had been made with the available data, assuming that the plantation will give a normal outturn.

Annual yield from each of the felling series of the Wattle Working Circle from 1954–55 to 1968–69.

NOTE.—The yield of the bark (dry) is in tons and that of the wood in lots of 120 c.ft. stacked.

Number.	Year.	Sholur Felling Series.		Avalanche Felling Series.		Mukurti Felling Series.		Badaganad Felling Series.	
		Bark.	Wood.	Bark.	Wood.	Bark.	Wood.	Bark.	Wood.
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
1	1954–55 ..	50	100	..	..	..	..	..	..
2	1955–56 ..	50	100	..	..	..	..	..	..
3	1956–57 ..	50	100	..	..	..	..	160	350
4	1957–58 ..	50	100	..	..	..	..	105	225
5	1958–59 ..	50	100	..	..	..	..	155	350
6	1959–60 ..	55	120	..	..	..	..	84	210
7	1960–61 ..	55	120	..	..	740	1,850	104	260
8	1961–62 ..	55	120	..	..	740	1,850	72	198
9	1962–63 ..	60	125	..	..	740	1,850	100	300
10	1963–64 ..	60	125	..	..	712	1,800	75	200
11	1964–65 ..	90	270	500	1,500	708	1,800	90	270
12	1965–66 ..	90	270	500	1,500	750	2,180	160	480
13	1966–67 ..	90	270	500	1,500	760	2,210	160	480
14	1967–68 ..	90	270	500	1,500	750	2,180	120	330
15	1968–69 ..	90	270	500	1,500	857	3,570	165	465

Abstract of the above statement showing the total yield for the division each year.

Number.	Year.	Bark.	Wood.	Number.	Year.	Bark.	Wood.
(1)	1954–55	50	100	(9)	1962–63	900	2,275
(2)	1955–56	50	100	(10)	1963–64	847	2,125
(3)	1956–57	210	450	(11)	1964–65	1,388	3,840
(4)	1957–58	155	325	(12)	1965–66	1,500	4,430
(5)	1958–59	205	450	(13)	1966–67	1,510	4,460
(6)	1959–60	139	330	(14)	1967–68	1,460	4,280
(7)	1960–61	899	2,230	(15)	1968–69	1,612	5,805
(8)	1961–62	867	2,168				

Section 5—Method of executing the fellings.

397. The areas to be felled annually is indicated in section 6 of this chapter. If for any reason the area allotted for the year is not exploited, it will have to be sold next year along with the compartments allotted for that year and not in lieu of any of them.

398. The areas allotted for the year will be exploited through the agency of contractors, who will have right to collect and remove, both the bark and the wood obtained from the standing growth sold to them. The area will be offered for sale in open auction in the month of February preceding the year of exploitation.

399. The lease period for each lease unit will be ten months commencing from the first of April of the allotted year. The area to be exploited annually in each series is given in paragraph 403. The lease unit in the case of the areas in Sholur and Badaganad Series will be the entire area allotted for the year. In the case of Avalanche and Mukurti Series, the area allotted for the year is too large to form a single lease unit. The District Forest Officer will have discretion to split up the allotted area into suitable lease units before the sale is published. Each such lease unit will have a lease period of ten months commencing from the first of April of the allotted year. The allotted annual area in Avalanche and Mukurti Series will have rows of one chain wide blue gum wind belts for every ten chains wide wattle growth. The wattle stand sandwiched between two or more such wind belts will form a convenient lease unit. In other words, the District Forest Officer will choose one or more of the sub-compartments in the allotted area to form separate lease units of about 30 to 50 acres.

400. All the trees in the areas taken up for exploitation will be completely clearfelled except the rows of wind belts of bluegum raised in the area. After the bark had been collected, the wood in the stems will be sawn into billets of 3 feet or 1½ feet length and stacked before removal. All material down to six inches in mid-girth will be stacked. The size of a standard stack or 'lot' is 8 feet by 5 feet by 3 feet. The subordinates concerned will keep an account of the removals of the wood in 'lots' and of the bark by weight, and submit it to the Range Officer periodically. The contractor can dispose of the firewood in the brushwood form (i.e., all material below 6 inches in mid-girth) from the area under felling by sale of head-load tickets at rates approved by the District Forest Officer.

401. All areas offered for sale will be surveyed before the sale and the area computed from such survey will be adopted for the sale. In the case of areas where blue gum wind belts had been raised, each wattle stand enclosed in between two rows of wind belts should be separately surveyed.

402. *Brushwood disposal for re-establishment.*—In the clearfelling areas, where the clearing is to be followed by natural regeneration, the contractor should pile up along contour all brushwood which he is not going to remove. The pile may be heaped up to a height of not more than 6 feet and to a width not more than eight feet at the base. The distance from pile to pile will not be less than one chain along the slope. The brushwood piled up along the contour should be broken up by gaps at frequent intervals to permit of easy access to the different parts of the area. A gap of six feet width will be necessary for about one chain length of the contour pile of brushwood. The gaps are necessary also to avoid excessive stagnation of water during the rains and to prevent stagnation of cold air during winter days. The brushwood piles along the contour should be sufficiently tightly packed to prevent weeds becoming established within the piles. In the succeeding rotation, the brush piles will be located midway between the piles of the last crop. The brushwood piles gradually decay and settle down with the passage of years.

Section 6—Tabular statement of fellings.

403. The following statements show the compartments to be worked annually in each of the felling series included in the Wattle Working Circle :—

Year of felling.	Name of the locality and compartment number.	Area in acres.	Estimated yield of bark in tons.	Estimated yield wood in lots of 120 c.ft. stacked.	Remarks.
	Ootacamund North Range.				
	Sholur Felling Series.				
1954–55	Sholur 1	18·00	50	100	
1955–56	Sholur 2	18·00	50	100	
1956–57	Sholur 3	18·00	50	100	
1957–58	Sholur 4	18·00	50	100	
1958–59	Sholur 5	18·00	50	100	
1959–60	Sholur 6	19·00	55	120	
1960–61	Sholur 7	19·00	55	120	
1961–62	Sholur 8	19·00	55	120	
1962–63	Sholur 9	19·00	60	125	
1963–64	Sholur 10	19·51	60	125	
1964–65	Sholur 1	18·00	90	270	
1965–66	Sholur 2	18·00	90	270	
1966–67	Sholur 3	18·00	90	270	
1967–68	Sholur 4	18·00	90	270	
1968–69	Sholur 5	18·00	90	270	
	Ootacamund South Range.				
	Avalanche Felling Series.				
NOTE.—There will be no fellings from 1954–55 to 1963–64 in this Series.					
1964–65	Avalanche 1	116·00	500	1,500	About one-eleventh of the area in each compartment will be occupied by blue gum wind belts, which will not be felled.
1965–66	Avalanche 2	116·00	500	1,500	
1966–67	Avalanche 3	116·00	500	1,500	
1967–68	Avalanche 4	116·00	500	1,500	
1968–69	Avalanche 5	116·00	500	1,500	
	Mukurti Felling Series.				
NOTE.—There will be no fellings from 1954–55 to 1959–60 in this series.					
1960–61	Mukurti 1	185·00	740	1,850	One-third of 1950.
1961–62	Mukurti 2	185·00	740	1,850	R.A. 1950.
1962–63	Mukurti 3	185·00	740	1,850	Do.
1963–64	Mukurti 4	178·00	712	1,800	Half of 1951 RA.
1964–65	Mukurti 5	177·00	708	1,800	Do.
1965–66	Mukurti 6	175·00	750	2,180	Part of 1952.
1966–67	Mukurti 7	177·00	760	2,210	Part of 1952 and 1953 RA.
1967–68	Mukurti 8	175·00	750	2,180	Do.
1968–69	Mukurti 9	200·00	857	3,570	1954 RA
1969–70	Mukurti 10	200·00	857	3,570	1955 RA.

About one-eleventh of the area in each compartment will be occupied by blue gum wind belt which will not be felled.

Year of felling.	Name of the locality and compartment number.	Area in acres.	Estimated yield. Bark in tons.	Wood in lots of 120 c. ft. stacked.	Remarks.
	Ootacamund and Coonoor Ranges.				
	Badaganad Felling Series.				
1956–57 ..	Hodgson's Hill ..	32·50	160	350	Old pyrethrum fields 1 to 3.
1957–58 ..	Ithalar—1 ..	21·95	105	225	1946–47 RA.
1958–59 ..	Kodanad—1 and 2	31·07	155	350	
1959–60 ..	Kokkothorai—1	21·00	84	210	
1960–61 ..	Kokkothorai—2	25·00	104	260	
1961–62 ..	Avaraihalla ..	18·23	72	198	1952 R.A.
1962–63 ..	Curzon Valley ..	25·00	100	300	Do.
1963–64 ..	Kulear ..	18·75	75	200	Do.
1964–65 ..	Doddabetta North	18·80	90	270	1953 R.A.
1965–66 ..	Ithalar—2 ..	40·00	160	480	1954 R.A.
1966–67 ..	Hodgson's Hill ..	32·50	160	480	1957 R.A.
1967–68 ..	Ithalar—1 ..	21·95	120	330	1958 R.A.
1968–69 ..	Kodanad—1 and 2	31·07	165	465	1959 R.A.

Section 7—Regulation of regeneration operations.

404. As a general rule, all black wattle plantations that are included in this working circle will be regenerated taking advantage of the numerous seedlings that spring up naturally from the seeds lying on the forest floor when the wattle stands are clear felled. In the following cases, however, regeneration will be done artificially by planting nursery raised black wattle seedlings, but when they, in their turn, are clear felled, natural regeneration will be resorted to for restocking the area.

Areas to be planted with black wattle seedlings.

Year of planting.	Name of the locality and compartment number to be planted.	Area in acres.	Ramarks.
1954	Avalanche—1	116·00	
	Mukurti—9	200·00	
	Ithalar—2	40·00	
		356·00	
1955	Avalanche—2	116·00	
	Sholur—1	18·00	
	Mukurti—10	200·00	
		334·00	
1956	Avalanche—3	116·00	
	Sholur—2	18·00	
		134·00	
1957	Avalanche—4	116·00	
	Sholur—3	18·00	
	Hodgson's Hill	32·50	
		166·50	
1958	Avalanche—5	116·00	
	Sholur—4	18·00	
	Ithalar—1	21·95	
		155·95	
1959	Avalanche—6	116·00	
	Sholur—5	18·00	
	Kodanad—1 and 2 ..	31·07	
		165·07	
1960	Avalanche—7	116·00	
	Sholur—6	19·00	
	Kokkothorai 1	21·00	
		156·00	

Year of planting.	Name of the locality and compartment number to be planted.	Area in acres.	Remarks.
1961	Avalanche—8	116·00	
	Sholur—7	19·00	
	Kokkothorai—2	25·00	
		160·00	
1962	Avalanche—9	116·00	
	Sholur—8	19·00	
		135·00	
1963	Avalanche—10	116·00	
	Sholur—9	19·00	
		135·00	
1964	Sholur—10	19·51	
		19·51	

405. *Wind belts.*—Wattle being shallow rooted species is liable to wind damage in exposed situations. It is therefore necessary to have windbelts to minimise the velacity of damaging winds in the area. In the recent past windbelts of bluegum were raised in the Mukerti area by planting 6 rows of bluegum 11′ × 11′ alternatively with 60 rows of wattle 11′ × 11′. Both bluegum and wattle being planted concurrently, the wind belt become fairly effective only after the 5th year or so when the bluegum grew sufficiently high. It is considered necessary to plant the bluegum at a closer espacement in future in order to make the windbelt more effective. Owing to the extremely undulating nature of the country and the multiplicity of ridges and spurs, the wind direction is seldom constant but tends to vary with aspect of configuration. Parallel wind belts are therefore not considered likely to be very effective. The damaging wind is that which sweeps down a ridge or spur and sweeps up the opposite slope. In order to reduce the valacity of this wind it is considered desirable to locate all wind belts on the main ridges in the annual regeneration area. It is accordingly prescribed that the whole regeneration area shall be staked 11′ × 11′ and the District Forest Officer shall decide which of the prominent ridges and spurs should be devoted to windbelts. The wind belts will be planted with bluegum $5\frac{1}{2}' \times 5\frac{1}{2}'$ by interpolating stakes between 3 rows as shown below :—

```
x o x o x o x
o o o o o o o
x o x o x o x
o o o o o o o
x o x o x o x
```

Blue gum wind belt 33′ wide.

x Original staking 11′ × 11′

o Interpolated stakes.

The wind belts will be planted with bluegum concurrently with the wattle in the plantation and are expected to be effective within 5 years of planting, if reasonably good stocking is ensured. The wind belts shall be retained when the wattle is exploited during the period of this Working Plan. It is anticipated that these wind belts will in time be colonized by a dense understorey of the invasive wattle thereby improving their effectiveness.

406, 407, 408, 409 } *Deleted.*

410. *Artificial regeneration with black wattle.*—The areas referred to in paragraph 404 will be planted in the allotted year with black wattle nursery raised seedlings in the space between the wind belts as indicated in paragraph 416. Planting will commence with the break of the south-west monsoon. Usually the planting will commence in the month of May and spread over the rainy days of the monsoon period. In any case, the entire planting in the area should normally be completed by the middle of July. In Coonoor Range, where the planting may commence about a month later than in the Ootacamund Range, it may be completed before the fifteenth of August.

411. Replacement of casualties will be done as and when noticed during the early weedings in the first year and completed before the end of October. In the second year also, casualties will be replaced till the end of October. Two ounces of fertilizer will have to be applied even during the replacements (Vide paragraph 416).

412. The planting operations and the maintenance of the plantations in all cases will be done departmentally. All shola patches occurring in the area will be left intact, but isolated trees occurring in the tract may be removed.

413. In the case of plantations to be raised in the Avalanche Series during the ten years commencing from 1954, if it is possible to get men to do potato cultivation in the areas between the wind belts of blue gum, wattle will be raised in conjunction with a potato crop. The soil working and the manure added to the potato crop in the area had been found to be very helpful in the successful establishment of wattle stands, to be raised for the first time, especially in the grassy tracts, where the root competition between the grass and the wattle in the early stages is really great.

414. The area in Avalanche Series which has to be planted with wattle in May-June of the year will be leased out for potato cultivation for a period of one year commencing from the 1st of January of that year. Potato crop will be raised in the area only for one year. In no case will it be extended beyond the first year, as the frequent turning up of the soil in the same area will lead to serious soil erosion. It is not necessary that the potato grower should remove his crop before planting of wattle takes place ; the planting will be done by the department in the pits (1 foot cube) dug and kept ready by the lessee at an espacement of 11 feet × 11 feet. The potato cultivators will be required to maintain contour trenches at an approximate distance of 15 feet vertical. The drains will be two feet wide and one foot deep and have a gentle gradient towards the natural drainings of the area.

415. If no one is forthcoming to do potato cultivation in the area, the planting up of the area will be done in the prescribed time, without potato cultivation ; in no case should the planting be postponed because no potato grower was forthcoming to cultivate the area.

416. The espacement to be adopted in all areas where black wattle seedlings are to be planted will be 11 feet × 11 feet. Mossed nursery seedlings between 9 and 12 inches in height, will be planted in pits, one foot cube dug in the month of April and filled in at the time of planting. In areas where the wattle is not raised in conjunction with potato crop, two ounces of fertilizer (mostly of superphospate) will be mixed up with the soil used for filling each pit. In areas where wattle is planted in pits kept ready by the potato grower, no manure need be added to each pit at the time of planting, as the residual manure in the area after the potato crop had been harvested will be available for the plants.

417. The wattle seedlings necessary for the regeneration work will be raised in nurseries. For a standard bed of 40 feet × 4 feet one pound of black wattle seeds will be used for sowing and about 3,600 plantable seedlings will be obtained from each bed. Care should be taken that the pods are collected from black wattle (Acacia molliissima) trees only and not from other wattle. On an average, including casuality replacements, a standard bed will be sufficient for about seven acres of plantation planted with an espacement of 11 feet × 11 feet. The nursery should be formed about the 15th September annually and all sowings completed by 15th October.

418. The nurseries should be formed mixing up the soil dug in the locality with about five baskets of shola earth for each bed. The ordinary basket used is about $1\frac{1}{2}$ feet in diameter and $1\frac{1}{2}$ feet in height in the shape of a rough cylinder. The seeds have to be pretreated before they are sown in the bed. The treatment of the seeds consist in adding the seeds to water brought to boil and allowing the seed to remain in it for 24 hours. The water should be first brought to boil, the vessel removed from fire and then the seeds added to the hot water and allowed to cool. The water should in no case be boiled by keeping it

on fire after the seeds had been added. The treated seeds will be taken out after 24 hours and washed five to six times with cold water to remove the viscous mucilage adhering to the seeds. The seeds will then be dried in the shade ; the treated seeds will retain their vitality for about nine months.

419. The treated seeds sown in the nursery beds will be covered with bracken fronds and watered. It takes 10 to 15 days for germination to take place. The bracken fronds spread over the beds will be removed after the germination had taken place. Watering of the nursery beds will be continued, watering being done daily. The young seedlings should be protected against the excessive cold of the nights by a cover erected with the aid of bracken fronds or similar material. When the seedlings reach a height of 4 to 6 inches, they will be ' mossed ', i.e., the seedlings will be taken from the beds with as much earth round the roots as possible, and the roots with the earth will be loosely wrapped round with moss and tied with suitable fibre. The seedlings will be kept in that condition, protected against excessive sun and drip, till the planting season. When so kept they must be removed once in fortnight to prevent the roots striking through. The fibre binding the moss will be unwound, while the seedlings is planted.

420. *Weedings.*—One of the most important features of successful wattle culture is the maintenance of the vigour of the wattle plants during the early stages of their growth, because the wattle is an extremely intolerant species and suffers greatly due to competition from other growth. Weeds and grasses competing with wattle will have to be removed frequently, until such time the wattle occupies the soil completely. Hence, in all areas planted with wattle, weeding will be done thrice in the first year (July-November-March) and twice in the second year (June-February). At each weeding, the soil to a radius of three feet round each wattle seedling will be scraped clean of all weed growth and grass.

421. *Protection against frost.*—Wattle seedlings in the planted area, which do not attain a height of 18 inches by the middle of October will be sheltered from frost with light covers made of bracken or tall grass. Mulching to cover the collar of the plants will also be done with the cut weeds of the area. Black wattle seedlings are extremely susceptible to excessive cold and are easily killed by frost. At the same time, it has to be borne in mind that they are strong light demanders. Hence it is essential that the frost covers that are used are not too thick to exclude the light completely. The shades should be removed as soon as the frost season is over, usually middle of February.

422. *Natural regeneration with Black Wattle.*—In all areas other than those listed under paragraph 404, the areas exploited will be pure stands of black wattle and therefore natural regeneration will be resorted to for reclothing the area with black wattle. Natural regeneration of wattle springs up in profusion in the clearfelled wattle areas with suitable soil preparation. Thousands of wattle seedlings will be available and what would be needed are (i) weeding of the competing growth and (ii) spacing of the plants in stages to the required number.

423. (i) After the clearfelling of the wattle growth is completed and the unremoved brushwood stacked in piles along contours as prescribed in paragraph 402, the area should be gone over in April immediately following the clearfelling, and all extraneous weeds should be removed so that they may not seed and establish in the cleared area and compete with the wattle growth springing up in the area. The weeds as far as possible should be uprooted, the unwieldy plants being alone cut back. The weeded plants should be thrown on the contour brushwood piles. Wattle being intolerant to any kind of interference or suppression, as it is a strong light demander, and being susceptible to root competition as it is shallow rooted, it is essential that weeding is thorough till wattle completely takes possession of the area.

(ii) Though wattle regeneration will spring up all over the area, in order to reduce the costs of maintenance and manuring, as well as to facilitiate further cultural operations, it is necessary to concentrate as much of the natural regeneration along definite strips. Hence the preparation of the soil for the creation of the suitable conditions for good germination of wattle, will be confined to strips 11 feet apart from each other and running along the contours. In between the brushwood piles, lines 11 feet apart will be taken along the contour and the soil along the lines will be raked up lightly to a width of one foot in order to produce a suitable seed bed by breaking up the humus mat and thus enable the seedling root systems to make contact with the mineral soil. The raking up of the soil in the one-foot wide strips will be done to a depth of about two inches in the mineral soil and the overlying humus as well as the seeds in site will be lightly mixed up with the fertilizers to be applied as indicated in the succeeding paragraph.

424. While the seed beds for the future crop are being prepared, it is essential that sufficient amount of fertilizers are applied so that the soil fertility of the area may be maintained. Wattle is a fast growing short rotation crop and the regular removal and repeated growing of wattle in the same area on a rotation of nine years would naturally deplete the supply of nutrients available from the soil. Further the application of the fertilizers stimulate the rate of growth in the early stages, which is necessary to avoid damage

by frost and animals. The easy and quick establishment of the wattle which accompanies the application of fertilizers causes early closure of canopy and thereby reduces the cost of frequent weedings. The rapid height growth induced by the fertilizer has the effect of raising the tender plants above the level of damaging frosts at an early age as well as create an increased vigour which is helpful in resisting the injuries to which wattle crop is liable. Hence, while the seed beds are prepared in the area by the light raking up of the soil along the 11 feet apart contour strips, fertilizers (mostly of superphosphate) to the extent of one pound for every 33 running feet will be applied and lightly mixed up with the soil.

425. With the fall of few showers of rains, a number of wattle seedlings will come up. It is necessary to keep them weeded of all other extraneous growth. In June and again in October of that year all weeds and grasses in the prepared strips should be carefully removed by uprooting them. All growth including wattle outside the one foot wide prepared strip, lying to a width of one yard on either side of the strip, will be cut flush with the ground while weedings are done in the strips. The vigour of the wattle plants is considerably reduced if its growth is interferred either by supperssion or root competition in the early stages of their life. Hence a good tending has to be done in the second year also in the month of June after the first thinning in the area had taken place in the month of March (Vide paragraph 427). This second year tending will consist of cutting back flush with the ground all growth (including the wattle that may have sprung up in the intervening space between any two prepared strips) outside the one-foot wide wattle strips. In the one-foot wide wattle strips, which will by this time have wattle plants about five feet apart (Vide paragraph 427), as much of the weeds that can be uprooted should be pulled out, and others should be cut flush with the ground and any grass growth in the strip should be scraped clean. Any climbers encircling the wattle plants in the strips should also be cut during this tending.

426. The following statement gives the list of areas, where natural regeneration operations have to be carried out during the period of the plan and in the succe ding five years :—

No.	Year.	Name of the locality and compartment number.	Area in acres.	Remarks.
1	1961	Mukurti—1	185·00	The regeneration operations include the preparation of the soil in one-foot wide strips 11 feet apart along contours in April of the allotted year and two weedings in the months of June and October of the year given in this statement.
2	1962	Mukurti—2	185·00	
		Avaraihalla	18·23	
			203·23	
3	1963	Mukurti—3	185·00	
		Curzon Valley	25·00	
			210·00	
4	1964	Mukurti—4	178·00	
		Kulear	18·75	
			196·75	
5	1965	Sholur—1	18·00	
		Avalanche—1	116·00	
		Mukurti—5	177·00	
		Doddabetta North	18·80	
			329·80	
6	1966	Sholur—2	18·00	
		Avalanche—2	116·00	
		Mukurti—6	175·00	
		Ithalar—2	40·00	
			349·00	
7	1967	Shollur—3	18·00	
		Avalanche—3	116·00	
		Mukurti—7	177·00	
		Hodgson's Hill	32·50	
			343·50	
8	1968	Sholur—4	18·00	
		Avalanche—4	116·00	
		Mukurti—8	175·00	
		Ithalar—1	21·95	
			330·95	

Section 8—Subsidiary Silvicultural Regulations.

427. *Thinnings.*—Wattle is a fast growing intolerant species which on account of its rather superficial lateral root system, is readily suppressed, if it does not receive adequate thinning, and which does not recover easily from suppression, particularly if this takes place during the early stages of its growth. Heavy and frequent thinnings must be undertaken during the early part of the rotation, if the high crown vigour is to be maintained. Since in most of the wattle stands of the locality, the culmination of the mean annual increment in respect of the height growth is reached in the third year, it is essential that the thinning operations should be completed before the end of the third year. It must be borne in mind that with sucessful natural regeneration there will be numerous seedlings of wattle and they have to be spaced out very early in their life, if they are not to suffer from root competition. This first spacing out of the plants will be done after the first winter season is over so that any casualty due to frost bite may be reduced and the spacing may be done with the plants that had survived the frost season. Hence, the first thinning will be done in the month of March following the first winter. The thinning will aim at spacing the plants five feet apart in the regeneration strips. All other wattle growth as well as other weeds in the area, both in the strips and in the area lying between them, will be cut back retaining only wattle plants spaced about five feet apart along the roads. In other words, after the first thinning operations are carried out, there will be rows of wattle plants eleven feet apart between the rows and about five feet apart between the plants in the lines. Thus when the plants are about nine months old the stocking will be about 800 plants per acre. After this thinning had been carried out, an enumeration of each line will be done, in order to assess the stocking. While enumerating the number of stretches over which there are no plants over distance of one chain and over will also be recorded.

428. In May-June following the above thinning, it may be necessary to supplement the natural regeneration by artificial regeneration by planting with mossed nursery raised plants in portions where the natural regeneration had not been successful. Though the enumeration figures may show in some cases a stocking less 800 stems per acre, it may not be necessary to plant all blanks in each row, because there will be a further thinning when the final stocking of about 400 stems per acre will be aimed at. Hence, the artificial regeneration done to supplement the natural regeneration lapses, will consist in planting mossed nursery raised seedlings ten feet apart in the rows, only in cases where there are failures over a distance of one chain or more along the rows. All beating up of such failed patches should be completed by the end of July, at the latest.

429. The areas where the thinning of the plants in the month of March of the allotted year to an average distantce of about five feet along the rows will have to be carried out during the period of the plan and in the succeeding five years are given in the following statement :—

No.	Year.	Name of the locality and Compartment number.	Area in acres.	Remarks.
1	1962	Mukurti—1	185·00	
2	1963	Mukurti—2	185·00	In these areas after the first thinning is completed in the month of March of the year indicated the beating up of the failed stretches referred to in paragraph 428 will be done in the months of May and June of the year. The second year tending prescribed in paragraph 425 will be done in these areas in the month of June of the year given in this statement.
		Avaraihalla	18·23	
			203·23	
3	1964	Mukurti—3	185·00	
		Curzon Valley	25·00	
			210·00	
4	1965	Mukurti—4	178·00	
		Kulear	18·75	
			196·75	
5	1966	Sholur—1	18·00	
		Avalanche—1	116·00	
		Mukurti—5	177·00	
		Doddabetta North	18·80	
			329·80	
6	1967	Sholur—2	18·00	
		Avalanche—2	116·00	
		Mukurti—6	175·00	
		Ithalar—2	40·00	
			349·00	

No.	Year.	Name of the locality and compartment number.	Area in acres.	Remarks.
7	1968	Sholur—3	18·00	
		Avalanche—3	116·00	
		Mukurti—7	177·00	
		Hodgson's Hill	32·50	
			343·50	
8	1969	Sholur—4	18·00	
		Avalanche—4	116·00	
		Mukurti—8	175·00	
		Ithalar—1	21·95	
			330·95	

430. When the wattle stand raised by natural regeneration completes about two years of its life the second thinning will be done in the area which will reduce the stocking to about 400 stems per acre. This will be the final thinning for the stand and hence the thinning will aim at a stocking of about 400 stems per acre, which is found to be the optimum number of stems required per acre for the locality to produce maximum yield under the rotation fixed in paragraph 394. Since the thinnings in wattle stands must anticipate suppression and must not be delayed until the trees need relief and because the culmination of the mean annual increment in respect of height growth usually takes place by the third year, if the final wattle crop should have the full benefit of the thinnings, they will have to be completed in the third year. Hence the final thinning will be done when the plants have nearly completed their two years of life and are in the third year of their existence. The thinning aimed to get a stocking of 400 stems per acre will be carried out normally by spacing out the plants at an average distance of ten feet along the rows. All other wattle growth still persisting in between the rows will have to be cut back to reduce competition. After the final thinning there will be rows of wattle plants eleven feet apart between the rows and about ten feet apart between the plants in the rows.

431. The first thinning in the wattle stands raised by the aid of natural regeneration is mostly of a routine nature and does not require any special skill. The work may therefore be assigned to a specially chosen forester, with the Range Officer and the District Forest Officer periodically checking the work. In the case of the second thinning special skill and judgment are required as it is the final spacing out of the plants, the work will have to be done in the presence of a forest officer not below the rank of a Range Officer, with the District Forest Officer, periodically inspecting the work while in progress. The yield from the first and second thinnings are not capable of giving any bark of value in trade.

432. The following statement furnishes the details of the areas where the second thinning had to be carried out during the period of the plan and the succeeding five years :—

No.	Year.	Name of the locality and compartment number.	Area in acres.	Remarks.
1	1963	Mukurti—1	185·00	
2	1964	Mukurti—2	185·00	The thinnings may be commenced in April and completed by the end of June.
		Avaraihalla	18·23	
			203·23	
3	1965	Mukurti—3	185·00	
		Curzon Valley	25·00	
			210·00	
4	1966	Mukurti—4	178·00	
		Kulear	18·75	
			196·75	
5	1967	Sholur—1	18·00	
		Avalanche—1	116·00	
		Mukurti—5	177·00	
		Doddabetta North ..	18·80	
			329·00	

No.	Year.	Name of the locality and compartment number.	Area in acres.	Remarks.
6	1968	Sholur—2	18·00	
		Avalanche—2	116·00	
		Mukurti—6	175·00	
		Ithalar—2	40·00	
			349·00	
7	1969	Sholur—3	18·00	
		Avalanche—3	116·00	
		Mukurti—7	177·00	
		Hodgson's Hill	32·50	
			343·50	

Section 9—Other Regulations.

433. *Collection of Statistics.*—It is most important that a careful and complete record of the fellings in the various compartments and the outturn realized from each are maintained, both for the weight of bark obtained and the volume of wood collected from each area.

434. *Compartment Boards.*—The correct maintenance of the all compartment boards at the salient corners of the compartment is essential. They will have to be replaced periodically, as the writing on the boards fade away due to rain and shine. Every year in the month of April, such of the boards that require replacement should be replaced.

435. *Fire protection.*—Wattle plantations should be protected against fire with special care in view of the fact they are raised amidst grasslands and also because a large fire which may not kill the plant may be damaging enough to reduce the value of the bark by scorching it. Hence, it is prescribed that all wattle areas will have a scraped line nine feet wide around each year's plantation. Further, in the case of the plantations of Avalanche and Mukurti series, for every stretch of wattle stand sandwiched between two wind belts, an internal line six feet wide running over the longer length of the area along an easy gradient will be maintained to serve as inspection lines, which will also incidentally serve as internal fire protection lines.

436. *Labour.*—The labour lines erected near Mukurti will be maintained. A set of similar labour lines will be required for housing about twenty families in the case of the Avalanche series. Apart from providing them houses to live in, an area of not more than half acre for each family may be given on lease for raising any crop they may require, both as an inducement for them to settle permanently in the colony as well as on account of the seasonal nature of the forest operations.

437. No additional staff for raising the plantations in the Avalanche series is necessary. The staff sanctioned for the Mukurti Plantations will be distributed between the Mukurti and Avalanche Series in the rate of 2 : 1. A forester and a plantation watcher will be required for the Sholur series.

438. Apart from the survey of the annual area in each series for planting purposes, in the case of the plantations to be raised in Mukurti and Avalanche Series, it is necessary to survey after the planting has been completed, the area of wattle between each set of two wind belts, so that the area of wattle in each sub-compartment may be known and the sub-compartments marked in the map.

439. *Research.*—At present there is only a tentative yield-table for the wattle. It is necessary that a set of suitable sample plots are selected and measurements taken periodically, so that by the time of the next revision of the plan, an yield-table for the black wattle of the locality may be available, giving us information not only about the rate of growth of height and diameter, but also the outturn in respect of both the bark and the wood.

440. The estimation of the tannin content in the bark of the stems of various age gradations of wattle stands will have to be determined with sufficient replications so that more accurate data may be obtained regarding the variation of tannin content with age. Since the tannin content varies with the various parts of the trees, in order to have an uniformity for comparison it is suggested that whenever barks are sent for the assay of tannin content, the bark may be collected from the portion of the stem lying between three and six feet from the ground.

441. A knowledge of the genetics mechanism in black wattle will make it possible for the development of strains, which will give better yields and better quality bark than is obtainable from the present stock. Experiments in the isolation of clonal strains which

will combine growth vigour and the production better quality and greater quantity bark with increased resistance to pests, diseases and frost will have to be conducted. Possibilities of interbreeding green wattle and black wattle to develop the more desirable and profitable varieties with hybrid vigour should be investigated.

442. *Disposal of the wood from the wattle areas.*—At present due to the paucity of blue gum firewood, the wattle wood is also sold in the local markets as firewood. But in future, in view of the greater output of blue gum firewood due to the increased acreage under blue gum, it would be possible only for a portion of the large volume of firewood from the wattle areas to find a market in the towns of this district. In order that the economics of the wattle plantations may not be affected, it is essential to allow the output from the wattle areas to flow through the normal trade channels without restricting the supplies only to the towns of the district. The firewood from the blue gum plantation will, however, be normally earmarked for local supplies. It is certain that the scarcity of fuel in the neighbouring district of Coimbatore, will make it possible for the larger volume of wood produced in the wattle areas to be absorbed easily.

443. In order to prevent any possibility of mixtures of inferior value arising out of hybridization of the different wattles, it is prescribed that, if in any of the wattle areas included in this working circle any wattle species other than *Acacia mollissima* is found during the cultural operations (weeding, tending or thinning as the case may be) they should be removed.

444. A compartment journal for each of the compartments included in this working circle will be maintained and all particulars relating to the costs of formation and maintenance of wattle stands, the yields obtained, the silvicultural operations carried out and other relevant information regarding the growing stock in the compartment, should be posted regularly.

445. *Control.*—The control forms relating to this working circle accompany this plan. They should be posted as soon after the close of every fiscal year.

CHAPTER IV.

WORKING PLAN FOR THE PYRETHRUM WORKING CIRCLE.

Section 1—General constitution of the working circle.

446. In accordance with G.O. Ms. No. 4059, Development, dated 13th August 1947, Pyrethrum will be cultivated in the Nilgiris division so as to provide an indigenous supply of Pyrethrum insecticide, which will meet the requirements of the Madras State. It had been estimated that the annual requirements would be about 60,000 lbs, of dry Pyrethrum flowers, and in order to achieve that target of production, the Pyrethrum Working Circle will extend over the following areas :—

(i) the Pyrethrum Fields at Ree's Corner, excluding Field Nos. 11 to 14 handed over to the Agricultural Department for rye cultivation in connection with ergot production ;

(ii) the Pyrethrum Fields of Muthinad ; and

(iii) the Pyrethrum Fields of Brookhampton including the new areas planted with Pyrethrum during 1951 and 1952.

447. The total area of the Pyrethrum Working Circle will be 639·03 acres. The area actually under Pyrethrum crop in 1953 is only 42·00 acres, and the rest of the area included in the working circle will be brought under Pyrethrum within the first five years of this plan, and thereafter continued on a rotation of five years.

448. The working circle will be divided into 3 planting series, of which, two will be in Ootacamund North Range and one in Ootacamund South Range. The distribution of the area included in the working circle is given below :—

Number and name of the range.	Name of the planting series.	Area in acres.
1 Ootacamund North ..	Brookhampton	348·70
2 Do.	Muthinad	176·85
3 Ootacamund South ..	Ree's Corner	113·48
	Total ..	639·03

449. The following statement gives particulars of the different fields included in the three planting series, constituted under this working circle :—

Number and name of the planting series.	Field number.	Area in acres	Number and name of the planting series.	Field number.	Area in acres.
		Ootacamund North Range.			
1 Brookhampton ..	1	10·00	1. Brookhampton—*cont.*	35	10·50
	2	9·50		36	10·70
	3	11·00		37	6·00
	4	11·50		38	25·00
	5	8·75			
	6	10·00			340·70
	7	8·50			
			2 Muthinad	1	8·00
	8	8·75		2	9·00
	9	9·25		3	8·75
	12	9·25		4	8·00
	14	9·25		5	7·00
	15	9·50		6	7·25
	16	8·25		7	6·50
	17	6·50		8	9·75
	18	7·25		9	6·75
	19	9·75		10	8·75
	20	9·75		11	10·25
	21	9·50		12	9·50
	22	7·25		13	10·00
	23	8·00		14	10·75
	24	7·75		15	10·00
	25	9·25		16	9·50
	26	9·00		17	8·75
	27	6·00		18	12·00
	28	10·25		19	7·25
	29	10·75		20	9·10
	30	11·00			
	31	10·50			176·85
	32	10·75			
	33	19·00			
	34	10·75			
		Ootacamund South Range.			
3 Ree's Corner ..	1	9·25	3 Ree's Corner—*cont.*	9	8·25
	2	6·73		10	10·50
	3	8·75		15	11·50
				16	12·75
	4	6·50		17	9·00
	5	7·50			
	6	7·25			113·48
	7	8·00			
	8	7·50			

Section 2—Blocks and compartments.

450. The areas included in this working circle are shown in the preceding statement. The unit for the maintenance of the monthly yield of flowers and for plantation history will be the ' Field ' and would correspond to the compartment of the forest parlance. Each field is given a number. The numbers are the same as those given in the previous schemes, so that a continuous history may be maintained and also to facilitate easy recognition in the field by the subordinates who are used to such identification.

451. Field numbers 11 to 14 of Ree's Corner Planting Series are excluded from this working circle, as they have been handed over to the Agricultural Department for rye cultivation, in connection with ergot production. Field numbers 10, 11 and 13 of Brookhampton Planting Series have been vacated for grazing purposes few years ago under the orders of the Chief Conservator of Forests, and hence do not appear in this working circle. Field numbers 37 and 38 of Brookhampton Planting Series are the 1951 and 1952 plantations near the Brooklands Drier and the new field numbers are shown in the maps accompanying the plan.

452. The boundaries of the fields will be maintained by fixing suitable posts at all salient corners, when the plantations are established. The field numbers will be clearly indicated on the sign posts along with the year of the plantation.

453. Maps of the fields included in this working circle have been made on a scale of 16 inches to a mile and accompany this plan.

Section 3—Analysis of the crop.

454. The existing plantations at Ree's Corner had been raised in parts of Field Nos. 3 and 16 and occupy a total area of 11·00 acres. The plantation had been raised in the old pyrethrum area which had remained fallow for nearly two years after potato cultivation with fertilizers. The condition of the crop is satisfactory in spite of the poor rainfall of the year and this is in contrast to the failures of pyrethrum raised immediately after potato cultivation using fertilizers. The areas proposed for future plantations are those which had been lying fallow for more than three years after potato had been cultivated. The satisfactory condition of the crop in the 1952 plantation at Ree's Corner indicates that the old potato cultivated pyrethrum fields which had been remaining fallow for more than two years can be regenerated with pyrethrum without fear of the failures which attended many a pyrethrum crop raised immediately after potato cultivation using fertilizers.

455. The two other plantations referred to in the previous paragraph are near the Brooklands Drier. The 1951 plantation is in a virgin area and measures six acres. It is a successful plantation and is blossoming well. The 1952 plantation is 25 acres in extent, but due to the unprecedented low rainfall of the year, the success had not been to the desired extent.

456. Experience in the recent past had taught the bitter lesson, that pyrethrum cultivation when followed immediately after a potato crop had been raised with fertilizers will be a dismal failure.

Section 4—Method of treatment.

457. The treatment proposed is : (i) to plant with pyrethrum the areas included under this working circle ; (ii) to collect departmentally the pyrethrum flowers, dry them and store them properly for despatch to the factory for the extraction of the pyrethrum ; (iii) to replant the fields with pyrethrum, after rotating the pyrethrum crop once in 5 years with winter wheat in keeping with good farming practice.

458. The system adopted in this working circle is akin to the silvicultural system of clearfelling followed by concentrated artificial regeneration, because the pyrethrum crop is removed after its age of maximum productivity and replaced entirely by fresh planting of pyrethrum seedlings or slips.

459. *Rotation.*—The experiments conducted in the Nilgiris as regards the yield of pyrethrum flowers had revealed that there is an appreciable and marked fall in the fourth year of its life. Hence it would not be advisable to keep the pyrethrum plants beyond four summers. The cost of replanting is very much less than the loss in yield that would accrue with the continuation of the same crop, and will be amply compensated by the yield from the replanted crop. Further, the consensus of opinion among the pyrethrum growers of the various countries in the world, is that it is incompatible with good farming to leave pyrethrum crops too long on the ground continuously, because weeds and diseases can be fought successfully only if a different crop is rotated with pyrethrum Wheat had been reported to yield very well after pyrethrum Wheat can be raised in the Nilgiris, easily and without the help of the fertilizers. Potato crop which involves the application of fertilizers will have to be ruled out in view of the great increase of the acidity of the soil, which causes practically a complete failure of the pyrethrum crop. As summer wheat is sometimes prohibited in the Nilgiris as a measure of wheat rust control, the alternate crop that will be used in the pyrethrum fields will be winter wheat. The wheat produced will contribute to some extent, to the output of food material apart from improving the condition of the soil. Hence a rotation of five years will be adopted, the pyrethrum crop being retained for four summers and the area rotated with winter wheat in the fifth year.

460. *Regulation of yield.*—The yield will be regulated by area. Each field will be a unit for recording the monthly yield of flowers collected from the crop contained in the field from the date of first picking of the date of its replacement.

461. Though the gross area of the different fields included in this working circle amount to 639·03 acres, the net area under pyrethrum will be only about 80 per cent of the gross area, because anti-erosion grass belts and contour drains as well as sholas, swamps and rocky patches would occupy the rest of the area. Hence it may be taken that the area plantable with pyrethrum would be about 500 acres. Since there will be winter wheat crop once in five years, the effective area under pyrethrum in any year after the full series had been built up would be about 400 acres. About 125 acres (effective area about 100 acres) will be replanted every year thereafter, and about 125 acres (effective area about 100 acres) used for raising winter wheat prior to the replanting of pyrethrum in the succeeding year.

462. The yield to be expected annually from each of the planting series is indicated below :—

		Yield of dry flowers in pounds.			
No.	Year.	Brookhampton planting series.	Muthinad planting series.	Ree's Corner planting series.	Total for the division.
1	1954–55	8,235	215	18,600	27,050
2	1955–56	14,920	6,245	31,450	52,615
3	1956–57	39,575	18,405	5,150	63,130
4	1957–58	44,220	21,835	Nil	66,055
5	1958–59	39,555	24,300	565	64,240
6	1959–60	30,435	16,855	16,950	64,240
7	1960–61	20,920	8,695	33,900	63,515
8	1961–62	41,125	18,405	5,650	65,180
9	1962–63	44,210	21,635	Nil	65,845
10	1963–64	39,555	24,300	565	64,420
11	1964–65	30,435	16,855	16,950	64,240
12	1965–66	20,920	8,695	33,900	63,515
13	1966–67	41,125	18,405	5,650	65,180
14	1967–68	44,210	21,635	Nil	65,845
15	1968–69	39,555	24,300	565	64,420

Section 5—Regulation of Planting Operations.

463. The areas to be planted or replated with pyrethrum annually are given below :—

No.	Year.	Name of the planting series.	Field numbers.	Gross area in acres.
1	1954	Brookhampton	1 to 9	87·25
		Muthinad	1 to 5	40·75
				128·00
2	1955	Brookhampton	12, 14 to 23	94·25
		Muthinad	6 to 10	39·00
				133·25
3	1956	Brookhampton	24 to 31	75·50
		Muthinad	11 to 15	50·50
				125·00
4	1957	Brookhampton	32 to 35, 37 and 38	82·00
		Muthinad	16 to 20	46·60
				128·60
5	1958	Brookhampton	36	10·70
		Ree's corner	1 to 10 and 15 to 17 ..	113·48
				124·18
6	1959	Same as item No. 1.		
7	1960	Same as item No. 2.		
8	1961	Same as item No. 3.		
9	1962	Same as item No. 4.		
10	1963	Same as item No. 5.		
11	1964	Same as item No. 1.		
12	1965	Same as item No. 2.		
13	1966	Same as item No. 3.		
14	1967	Same as item No. 4.		
15	1968	Same as item No. 5.		

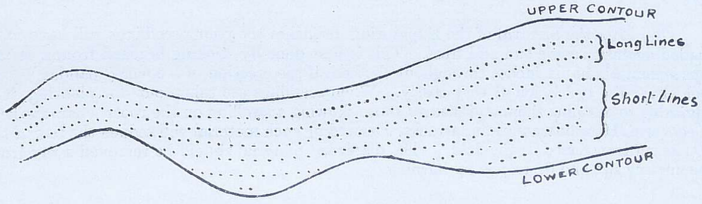
464. The areas given in the preceding statement are the gross areas of the entire plantation. After planting, the gross area of each field will be found out by survey. The area actually under pyrethrum (the effective area) will be computed for each field from the number of seedling planted. The gross area and the effective area of each field should be entered in the control records.

465. For the first three or four years, the planting of pyrethrum will be mostly in the lands that were lying fallow for the past three to six years. Subsequent replanting will take place after a winter wheat crop is raised in the area.

466. *Preparation of the planting area.*—It is necessary to clean the planting area thoroughly of all weeds and particularly of all grass before planting is done. The preparation should begin immediately after the winter wheat crop is harvested and all operations in the area, which precede the actual planting, should be completed before the end of March. In areas where the planting is done without the preceding crop of winter wheat, as would be the case mostly for the first three or four years of this plan, the preparation of the land should commence in January of the planting year and completed before the end of March. As a soil conservation measure, an uncultivated grass belt of six feet width along the contour will be left intact for every 15 feet vertical interval. In areas like Ree's Corner where contour drains are existent at an approximate distance of 15 feet vertical no separate grass belts need be maintained. In areas where no contour drains exist, the main anti-erosion measure would be the uncultivated grass belts along the contours; however, to ensure effective drainage as well as soil conservation, for every four strips of contour grass belts, one contour trench will be dug. The contour drain would be two feet wide and one foot deep and have a gradient of 1 in 400 towards the natural drainage in the area. The contour drain will lie exactly in the middle of every fourth contour grass belt, that is to say, every three contour grass belts of 6 feet width will be followed by a combination of contour drain and grass belt. As the contour drain will be in the middle of the grass belt, the drain will have two feet width of grass belts both above and below the top and lower contours of the trench. The soil dug out will be heaped up along the lower contour.

467. In between the contour trenches or grass belts left as a soil conservation measure, the entire area will be forked, the weeds picked and thrown on the grass belts, and the clods turned over so that the grassy face goes inside. The clods will be broken lightly after a fortnight and allowed to weather. It should however be borne in mind that the soil should not be broken into a fine tilth, because during the further operations in the field such as picking of the flowers, weeding and inspection of the areas, the constant trampling of the human feet causes the soil to compact into hard mass. It is however essential that before planting takes place in the area, all weeds, which had taken possession of the worked area should again be removed and thrown along the contour on the uncultivated grass belts.

468. As the width of the land lying in between the contour trenches or the anti-erosion grass belts will differ according the degree of the slope of the field, the planting lines will be so aligned that they are parallel to the top contour of the cultivable belt, so that the short lines are along the lower contour as shown below :—



469. *Espacement.*– Judged by the results of the experiments conducted in at Nanjanad Farm, as well as keeping in view the necessity to reduce the soil wash to the minimum as most of the pyrethrum fields lie on an undulating country, it is found that the planting of pyrethrum in rows two feet apart, with the plants two feet from each other in the row would yield the most desirable results commensurate with planting costs. It had been found by experience that normally a pyrethrum bush attains a diameter of about 9 inches and hence very little ground will be exposed by adopting the chosen espacement, either for soil deterioration or for invasion of weeds. Instead of adopting a square espacement of 2′ × 2′ the planting will be carried out as indicated below in order to check soil erosion :—

P P P P P P P
P P P P P P
P P P P P P P

470. *Planting procedure.*—As soon as the first premonsoon showers are received in April-May nursery seedlings with at least six leaves will be planted out as indicated in the preceding paragraph. The plants will be placed in the planting hole made by a small stick to a depth of two to three inches. If there are too many leaves in the seedlings some of them may be pruned before planting. After the plant had been inserted into the planting hole it should be firmly pressed around the plant, the pressing of the soil around the plant should not result in a saucer like depression, as pyrethrum is very intolerent of stagnant moisture and swampy conditions. During planting all swampy patches in the field as well as shola bits will be excluded. Planting should normally be completed by the end of May. In no case should it be delayed beyond the 30th of June.

471. *Weedings.*—Pyrethrum fields should be kept completely free from all weeds if the production of flowers have to be kept at the maximum level. All weeds in between the grass belts or contour trenches should be removed and heaped along the contour on the grass belts or on the lower side of the trenches. It is not advisable to leave the weeded material inside the cultivation belts, because the seeds of the weeds germinate again profusely in the pyrethrum field. Weedings will be done thrice in a year during the entire life of the plantation. The first weeding of the year will be done in July, the second in October and the third in February. During first weeding of each year, all casualties should be replaced except in the fourth year. During weedings all dried flower-stalks in the bushes should also be carefully removed, and great care should be taken to see that there is no disturbance or shock to the root system of the pyrethrum plants, as they suffer badly from such disturbances.

472. *Nursery.*—A permanent nursery will be maintained in Brookhampton. Pyrethrum seeds number nearly 20,000 to an ounce, but the germination per cent is as low as $12\frac{1}{2}$ per cent. The number of utilizable plants are found to be about 2,500 per standard bed of 40 feet × 4 feet when 4 ounces of seeds are sown per bed. The plants can be split at the roots at least into two, before planting. Hence three standard beds would provide sufficient seedlings for an acre including replacement of casualties. Normally provision has to be made for 20 to 25 per cent casualties.

473. The seed-beds measuring 40 feet × 4 feet will be raised 6 inches high by heaping the dug out soil. Before forming the bed the soil will be well mixed with shola earth (six baskets per bed) and organic manure like cow-dung (three baskets per bed). The ordinary basket used is about $1\frac{1}{2}$ feet in diameter and $1\frac{1}{2}$ feet in height in the shape of a rough cylinder.

474. Sowing of the seeds should be done between the 15th of September and the 15th of October. Four ounces of seeds will be sown per bed and covered with Eupatorium branches not in flower. The covering will be removed after a fortnight when the seeds have germinated. Watering will be done twice a day, in the morning and the evening from the date of sowing to the end of March or till the seedlings are about 4 inches high on an average whichever is earlier. Subsequently watering will be done only once in a day till the nursery seedlings are used for planting out in the field. The watering will be done with "rose top" watering cans (cylindrical in shape of about 10 inches diameter and 15 inches height) and on each occasion of watering 8 cans of water will be used per bed.

475. After the removal of the Eupatorium branches the young seedlings will have to be shaded against severe sun and frost. This is best done by sticking bracken fronds at an espacement about six inches throughout the bed, if the erection of a cover ('pandal') one foot above the bed is found very costly. When seedlings are taken out for planting, it is advisable to examine them and discard those showing a swelling on the roots characteristic of eelworm (Heteroderamarioni) attacks. Discarding such material will reduce the risk of the pest being transferred to the field. The discarded material should be removed away from the nursery site and destroyed by burning.

Section 6—Method of exploitation of the produce.

476. *Picking of the flowers.*—The bushes usually flower in about six to nine months after planting depending upon dry and wet spells of weather, the plants beginning to flower even after four months if good showers are received after planting. After the first flowering each wet spell is succeeded by a fresh flush of flowers, the May-June bloom following a cold winter being the heaviest. Based on past experience, about 20 lb of fresh flowers can be obtained per acre on an average in the first year, about 600 lb per acre during the second year about 1,200 lb the third year and about 200 lb in the fourth year. In other words during a single rotation one acre pyrethrum crop will yield about 2,200 lb of fresh flowers on an average.

477. The keeping quality of the flowers and the pyrethrum content depends on the stage at which the flowers are picked and the way they are stored. The optimum time for picking a flower is when two-thirds of the disk florets are fully open. Picking in the same field has to be done once in a week or fortnight according to the abundance of the flush of flowers. By holding the flower between the thumb and the index finger and giving a gentle jerk, the flower is easily collected without much of the adherent stem and without causing injury to the plants. The pickers will be paid on the weight of fresh flowers collected. The flowers on picking are kept in a light wicker basket carried by the picker.

478. The areas where the pyrethrum flowers are to be collected are given below for each year :—

Year.	*Brookhampton planting series field numbers.*	*Gross area in acres.*	*Muthinad planting series field numbers.*	*Gross area in acres.*	*Ree's corner planting series field numbers.*	*Gross area in acres.*	*Total gross area in acres.*
1954–55	1 to 9, 37 and 38.	118·21	1 to 5 ..	40·75	1 to 10 and 15 to 17.	113·48	272·48
1955–56	1 to 9, 12, 14 to 23, 37 and 38.	212·15	1 to 10 ..	79·75	Do.	113·48	405·73
1956–57	1 to 9, 12, 14 to 31.	256·00	1 to 15 ..	130·25	Do.	113·48	159·73
1957–58	1 to 9, 12, 14 to 35, 37 and 38.	338·00	1 to 20 ..	176·85	..	..	514·8
1958–59	12, 14 to 38.	261·45	6 to 20 ..	136·10	1 to 10 and 15 to 17.	113·48	511·03
1959–60	1 to 9 and 24 to 38.	254·45	1 to 5 and 11 to 20.	137·85	Do.	113·48	505·78
1960–61	1 to 9, 12, 14 to 23 and 32 to 38.	274·29	1 to 10 and 16 to 20.	126·35	Do.	113·48	514·03
1961–62	1 to 9, 12, 14 to 31 and 36.	265·70	1 to 15 ..	130·25	Do.	113·48	519·43
1962–63	1 to 9, 12, 14 to 35, 37 and 38.	338·00	1 to 20 ..	176·85	..	..	514·85
1963–64	12 and 14 to 38.	261·45	6 to 20 ..	136·10	1 to 10 and 15 to 17.	113·48	511·03
1964–65	Same as item No. 6.						
1965–66	Same as item No. 7.						
1966–67	Same as item No. 8.						
1967–68	Same as item No. 9.						
1968–69	Same as item No. 10.						

479. *Drying.*—The collected produce will be carried to the drier and the flowers immediately spread out on trays for drying. In sunny days, the flowers are dried on the specially prepared cement plastered courts constructed near the driers. Drying on any material other than the special wire mesh trays or the cement surface referred to, should be prohibited. While drying, it is essential to stir the flowers once in three hours so as to get uniform drying. The flowers kept in the sun are removed before dusk every day and kept under the roof, for the night, so as to avoid exposure to the dew. Sun drying takes about four or five days. On rainy or cloudy days the flowers are kiln dried at the specially constructed driers. The flowers are spread out on wire mesh trays 6 feet × 3 feet and about three to four inches deep and dried at a temperature of 130°F while drying, as higher temperatures lead to the decomposition of the pyrethrins. Ordinarily it takes about eight to ten hours to dry the flowers by this method, the capacity of each drier being about 1,000 lb. of fresh flowers. Even on sunny days if the out-put is too great drying by the kiln method can be restored to, if the cemented courts cannot contain the entire collection.

480. *Packing.*—The loss in dryage is usually 75 per cent, that is, 4 lb. of fresh flowers may be taken to yield about 1 lb. of dry flower. After dryage the flowers are weighed and packed in gunny bags containing about 55 to 60 lb. of flowers. It is advisable to use double gunny bags to prevent serious loss on storage. It is also advisable not to store in our custody beyond three months, as loss of pyrethrin had been noticed on prolonged storage. As soon as possible, the dried flowers should be despatched to the factory. At present mostly the produce is sent to the Government Kerala Soap Institute for the making of pyrthrin extracts. If the Kerala Soap Institute is not able to utilise the entire output of flowers produced annually the excess may be sold in open auction.

Section 7—Subsidiary cultural operations.

481. As the economic life of the pyrethrum crop is only 4 years, it is necessary to replace it again if there is to be no loss in production. In keeping with good farm practice it is necessary to rotate the crop with a cereal crop like winter wheat, because weeds and diseases can be fought successfully only by rotation with an alternative crop. Further the structure of the soil will also be improved by raising a wheat crop. Hence it is prescribed that after the pyrethrum crop had held the field for four summers, it will be replaced again with pyrethrum after a crop of winter wheat is raised during the fifth year.

482. In September the pyrethrum crop which had completed four years will be uprooted, and the soil in the pyrethrum area will be worked either with a plough or fork in order to make it suitable for rasing a crop of winter wheat. Before the pyrethrum plants are

removed all the flowers in the plants will be gathered and sent to the drier. The contour trenches and the anti-erosion grass belts will be continued to be maintained during the wheat cultivation also. After the wheat crop is harvested, the area will be prepared for replanting with pyrethrum, as indicated in paragraphs 466 to 468.

483. The cultivation of the wheat will be done departmentally. The possibility of leasing it out had been considered and ruled out, as the lessee might add fertilizers to the soil surreptitiously in the hope of a bumper crop, however stringent the conditions of the lease may be prohibiting it. The wheat will be harvested departmentally and the produce sold in open auction.

484. The details of the areas to be cultivated with wheat during each year are given below :—

Year.	Name of the planting series.	Field numbers.	Gross area in acres.
1954–55	..	..	..
1955–56	..	..	..
1956–57	Brookhampton	37 and 38	31·00
1957–58	Ree's Corner	1 to 10 and 15 to 17	113·48
1958–59	Brookhampton	1 to 9	87·25
	Muthinad	1 to 5	40·75
			128·00
1959–60	Brookhampton	12, 14 to 23	94·25
	Muthinad	6 to 10	39·00
			133·25
1960–61	Brookhampton	24 to 31	74·50
	Muthinad	11 to 15	50·50
			125·00
1961–62	Brookhampton	32 to 35, 37 and 38	82·00
	Muthinad	16 to 20	46·60
			128·60
1962–63	Brookhampton	36	10·70
	Ree's Corner	1 to 10 and 15 to 17	113·48
			124·18
1963–64	Same as item No. 5.		
1964–65	Same as item No. 6.		
1965–66	Same as item No. 7.		
1966–67	Same as item No. 8.		
1967–68	Same as item No. 9.		
1968–69	Same as item No. 5.		

Section 8—Other Regulations.

485. *Research.*—The yield of flowers as well as pyrethrin content from different individual plants in a pyrethrum crop had been found to show enormous variation. This variation shows that plant selection though a laborious process is likely to yield handsome dividends. However, tests made from the progeny of rich mother plants obtained through seed have shown disappointing results, as regards pyrethrin yield, though other vegetative and floral characteristics were found to recur in the progeny. But vegetative propagation through splits or rooted shoots obtained from parent plants rich in pyrethrins had resulted in the continued yield of flowers of high pyrethrin content. Research in the isolation of clonal strains combining high flower yields and high pyrethrin content is therefore indicated. Research to find out a suitable manure for the pyrethrum fields is also necessary to maintain and improve the productivity of the soil in which it is grown.

486. *Driers.*—The Driers at Muthinad, Brooklands and Baikie will be maintained for drying and storing the flowers collected from the adjoining fields. They will also serve as wind belts and reduce the extent of loss of soil moisture due to descication by wind.

487. *Fencing.*—All pyrethrum plantations will be protected against grazing by having an effective fence enclosing convenient groups of fields. At present barbed wire or woven wire fences are used. However, along the side of the wire fence, a live fence of blue gum 6 feet apart planted. When they grow up as trees they will be useful for nailing the existing barbed wires instead of replacing the fence posts periodically.

488. *Collection of seed.*—Bushes which produce exceptionally large numbers should be specially marked in January and seeds from these bushes only will be collected during the summer. The heads collected for seeds should be allowed to dry completely for six weeks, after which the seeds will be separated from all chaff by sieving. The seeds will be stored in air tight tins previously sprayed with pyrethrin insecticide.

489. A systematic record of all operations, their cost and results should be maintained for the plantations raised each year in the form of a plantation journal. In addition to the plantation journal of each year's plantation, a register in foolscap size will be maintained for each planting series for the whole rotation. In this register, few pages will be allotted for each field number. In respect of each field, the following particulars will be entered :—

(i) Name of the Planting Series.

(ii) Number of the field.

(iii) Total area of the field.

(iv) Effective area of the field (i.e., the area actually under pyrethrum after deducting the space occupied by contour trenches, anti-erosion grass belts, sholas, etc.

(v) Year and month of planting with Pyrethrum.

(vi) Yield of flowers (fresh) for every month.

(vii) Year and month of the removal of the Pyrethrum crop.

490. *Control.*—The control forms which accompany this plan should be posted soon after the close of each financial year.

CHAPTER V.

WORKING PLAN FOR THE SELECTION WORKING CIRCLE.

Section 1—General constitution of the working circle.

491. The Selection Working Circle includes 30 compartments lying in Mudumalai Range. The compartments allotted to this working circle include the deciduous type of forests, which contain some of the common timber species of South India like teak (*Tectona grandis*), rosewood (*Dalbergia latifolia*), venteak (*Legerstroemia lanceolata*), vengai (*Pterocarpus marsupium*), mathi (*Terminalia tomentosa*) and *Grewia tiliaefolia.*

492. The object of this working circle is (i) to exploit the mature and overmature saleable timber trees without unduly exposing the soil and with due silvicultural safeguards by adopting the selection system of fellings and (ii) to carry out suitable cultural operations to improve the condition and the composition of the copt (?) crop.

493. The gross area of the compartments included in this working circle is 34,875 acres of which 951 acres are occupied by teak plantations. Hence, the area under the selection working circle is 33,924 acres.

Section 2—Blocks and compartments.

494. The 30 compartments included in this working circle lie in three different blocks. Six of them are situated in Teppakadu Block, thirteen in Mudumalai Block and eleven in Benne Block. The Blocks are demarcated by cleared lines, and the boundaries of the compartments generally follow natural features or existing lines, roads or paths.

495. The following statement shows the number of the compartments allotted to this working circle, their area and the blocks in which they are situated :—

Number.	Name of the block.	Compartment number.	Total area in acres.	Acreage under plantations.	Net area included in this working circle.
1	Teppakadu	1	1,315	258	1,057
2	Do.	2	940	109	831
3	Do.	3	1,188	181	1,007
4	Do.	4	1,330	139	1,191
5	Do.	10	808	..	808
6	Do.	11	929	..	929
			6,510	687	5,823
7	Mudumalai	15	1,568	..	1,568
8	Do.	16	1,127	..	1,227
9	Do.	17	905	..	905
10	Do.	18	800	59	741
11	Do.	19	1,105	86	1,019
12	Do.	20	1,358	33	1,325
13	Do.	21	1,296	..	1,296
14	Do.	22	1,498	..	1,498

Number.	Name of the block.	Compartment number.	Total area in acres.	Acreage under plantations.	Net area included in this working circle.
15	Mudumali	23	1,366	..	1,366
16	Do.	24	986	..	986
17	Do.	25	1,291	..	1,291
18	Do.	26	2,096	22	2,074
19	Do.	27	1,157	..	1,157
			16,653	200	16,453
20	Benne	29	930	2	928
21	Do.	30	1,280	40	1,240
22	Do.	31	1,290	..	1,290
23	Do.	32	806	16	790
24	Do.	33	980	6	974
25	Do.	34	866	..	866
26	Do.	35	1,207	..	1,207
27	Do.	36	1,204	..	1,204
28	Do.	37	1,158	..	1,158
29	Do.	38	785	..	785
30	Do.	39	1,206	..	1,206
			11,712	64	11,648
		Total ..	34,875	951	33,925

496. Description of the above compartments is given in Appendix XIV of this working plan.

497. The position of the compartments and the stock in them are shown in the detailed maps accompanying this plan. The maps have been drawn to a scale of 4 inches to a mile.

Section 3—Analysis of the crop.

498. The compartments included in this working circle contain forests falling under the " moist deciduous and dry teak " types described in paragraphs 76 to 81 of this plan. Enumeration of the saleable timber species in the compartments that will be worked during the period of this plan had been carried out on a 10 per cent basis by the stratified random sampling method, by taking two random strips one chain wide for every stratum or block of 20 chains width. The distribution of the various girth classes in the different saleable timber species and the merchantable volume in the growing stock in respect of each of them, as computed from the results of the enumerations are given in the following statements :—

No.	Block and compartment.	Area in acres included in this working circle.	Species.	1–2 feet girth.		2–3 feet girth.		3–4 girth.		4–5 girth.		5–6 girth.		6 feet girth.	
				Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
1	Teppakadu—1 ..	1,057	Teak ..	6,503	13,006	6,380	31,262	3,969	35,821	3,010	43,946	1,685	37,238	932	30,294
			Mathi ..	4,321	12,963	3,714	25,998	2,622	31,464	1,285	21,845	563	14,075	431	16,065
			Vengai ..	9	27	44	298	53	683	53	848	53	1,219	17	510
			Venteak ..	26	52	5	245	26	286	..	..	..	..	8	256
			Rosewood ..	9	18	62	372	35	385	18	324	26	702	26	988
			Grewia ..	211	422	7,304	43,804	7,128	78,508	1,848	31,416	132	3,168	53	1,696
			Total ..	11,079	26,488	17,539	101,979	13,833	147,147	6,214	96,379	2,459	56,402	1,467	49,629
2	Teppakadu—2 ..	831	Teak ..	3,077	6,154	3,091	15,146	2,756	24,804	2,581	38,715	1,739	60,258	1,187	38,004
			Mathi ..	2,756	8,268	3,132	21,924	3,118	37,416	1,642	27,914	897	22,425	717	25,095
			Vengai ..	14	42	14	98	82	902	69	1,104	41	943	28	840
			Venteak ..	924	1,848	286	2,202	217	2,387	166	2,822	124	2,976	110	3,520
			Rosewood ..	..	..	..	..	14	154	41	738	..	..	14	532
			Grewia ..	14	28	649	3,894	1,007	11,077	594	10,098	124	3,076	83	2,656
			Total ..	6,785	16,340	7,172	43,264	7,194	76,740	5,093	81,391	2,925	89,678	2,139	70,647
3	Teppakadu—3 ..	1,007	Teak ..	4,069	8,138	5,564	27,363	4,238	38,082	2,392	35,880	1,416	31,174	689	22,048
			Mathi ..	1,326	3,978	2,730	19,110	2,327	27,924	1,508	25,636	975	24,375	611	21,385
			Vengai ..	..	..	..	..	13	143	26	416	13	299	13	390
			Venteak ..	1,599	3,198	1,755	12,285	676	7,436	364	6,188	104	2,496	130	4,160
			Rosewood ..	39	78	13	78	39	429	91	1,638	65	1,755	13	404
			Grewia ..	26	52	169	1,014	754	8,254	1,209	20,553	793	17,932	390	12,480
			Total ..	7,059	15,444	10,231	56,850	8,047	82,268	5,590	90,311	3,367	78,031	1,846	60,687

No.	Block and compartment.	Area in acres included in this working circle.	Species.	1–2 feet girth.		2–3 feet girth.		3–4 girth.		4–5 girth.		5–6 girth.		6 feet girth.	
				Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.	Number of trees.	Merchantable volume cubic feet.
				(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
4	Teppakadu—4 ..	1,191	Teak ..	1,353	2,706	1,265	6,198	1,936	17,424	2,761	44,415	2,090	45,980	1,617	51,744
			Mathi ..	2,079	6,237	2,816	19,712	2,453	29,436	1,760	29,920	1,276	31,900	1,100	38,500
			Vengai ..	..	..	22	164	33	363	154	2,464	143	3,289	123	3,960
			Venteak ..	1,144	2,288	1,199	8,393	594	6,534	660	11,220	473	11,452	438	14,016
			Rosewood ..	22	44	88	528	55	605	176	3,168	121	3,267	45	1,710
			Grewia ..	77	145	528	3,168	979	10,769	1,078	25,872	814	19,236	473	15,136
			Total ..	4,675	11,422	5,918	38,163	6,050	65,131	6,589	117,059	4,917	115,424	3,805	125,066
5	Teppakadu—11 ..	929	Teak ..	7,142	14,284	8,712	42,684	6,091	54,819	4,221	63,322	1,462	32,164	752	24,064
			Mathi ..	5,642	16,926	4,322	30,446	2,561	30,732	1,402	23,834	663	11,575	431	15,085
			Vengai ..	12	36	32	216	32	352	21	323	51	1,173	31	930
			Venteak ..	231	462	112	774	53	583	31	536	11	264	12	384
			Rosewood ..	..	..	74	424	81	891	142	2,548	43	318	53	2,014
			Grewia ..	161	322	871	5,226	1,250	13,750	760	11,520	281	6,744	61	1,952
			Total ..	13,188	32,030	14,123	79,770	10,068	101,127	6,577	102,083	2,511	52,238	1,340	44,429
6	Benne—32	790	Teak ..	51	102	62	704	123	1,117	262	3,930	154	3,388	131	4,192
			Mathi ..	752	2,256	903	6,321	1,154	13,848	1,151	19,567	1,221	28,035	1,202	42,070
			Vengai ..	93	279	131	917	54	594	81	1,296	92	1,230	63	1,890
			Venteak ..	371	742	374	2,618	302	3,322	303	5,148	192	4,604	254	1,924
			Rosewood ..	64	128	102	609	82	902	64	1,144	64	1,656	75	8,160
			Grewia ..	112	224	671	4,126	1,351	14,561	711	12,087	231	3,544	66	2,112
			Toral ..	1,443	3,731	2,243	15,295	3,066	34,344	2,572	43,172	1,954	42,457	1,791	60,348
7	Benne—33	974	Teak ..	55	110	143	691	77	693	..	..	11	242	10	352
			Mathi ..	1,320	3,960	2,321	16,247	1,716	20,592	1,111	18,887	726	18,150	825	28,875
			Vengai ..	132	396	275	1,925	286	3,146	154	2,464	77	1,771	33	990
			Venteak ..	539	1,178	891	6,237	880	9,680	440	7,480	418	10,032	616	19,712
			Rosewood ..	264	528	363	2,178	441	4,851	198	3,564	110	2,640	176	6,688
			Grewia ..	143	286	704	4,224	1,232	13,552	693	11,781	319	7,656	165	4,280
			Total ..	2,453	5,458	4,697	31,502	4,632	52,514	2,596	44,176	1,661	40,491	1,825	60,897

8	Benne—34	866	Teak ..	..	..	..	..	..	..	..	..	..	..	..	..
			Mathi ..	2,280	6,480	2,136	14,592	1,824	21,888	1,476	25,092	1,092	27,200	960	33,600
			Vengai ..	108	324	204	1,428	276	3,036	252	4,032	72	1,656	144	4,320
			Venteak ..	480	960	756	5,292	540	5,940	828	14,076	504	12,096	552	17,664
			Rosewood ..	96	192	180	1,080	240	2,640	228	4,104	168	4,032	78	2,964
			Grewia ..	336	772	612	3,672	612	6,732	492	15,744	252	6,804	48	1,824
			Total ..	3,300	8,988	3,888	26,424	3,492	40,236	3,276	63,058	2,088	51,888	1,782	60,372
9	Benne—35	1,207	Teak ..	..	..	10	49	9	81	19	285	..	..	..	..
			Mathi ..	890	2,670	1,990	13,930	1,930	23,160	1,530	26,010	820	20,500	525	18,375
			Vengai ..	54	162	164	1,348	148	1,628	148	2,368	99	2,277	58	1,740
			Venteak ..	1,230	2,460	1,190	8,330	958	10,838	832	14,144	908	21,792	496	15,872
			Rosewood ..	140	280	278	1,668	399	4,389	358	6,444	266	7,182	242	9,196
			Grewia ..	308	716	1,294	7,764	2,136	23,496	1,393	43,616	554	13,296	98	3,137
			Total ..	2,622	6,288	4,926	33,089	5,580	63,592	4,250	92,687	2,647	65,047	1,419	48,219
10	Benne—37	1,158	Teak ..	187	374	561	2,805	924	8,316	1,287	19,305	902	20,944	638	21,416
			Mathai ..	341	1,023	902	6,314	1,936	23,232	2,717	35,189	2,926	73,150	1,584	55,440
			Vengai ..	11	33	88	616	176	1,936	297	4,752	384	8,855	385	11,550
			Venteak ..	165	330	231	1,386	781	8,561	847	14,399	770	18,480	165	5,230
			Rosewood ..	22	44	99	594	220	2,420	165	2,970	231	6,237	88	3,344
			Grewia ..	..	..	275	1,650	847	9,317	803	13,651	649	15,576	220	7,040
			Total ..	726	1,804	2,156	13,365	4,884	53,812	6,116	90,266	5,863	143,242	3,080	104,070
	Grand total ..	10,010		53,350	127,993	72,893	439,701	66,846	719,611	48,873	822,752	30,392	734,898	20,494	684,724

499. It will be seen from the preceding statement that the type of forest to be dealt with is very irregular. There is great variation both in the distribution of girth classes as well as in the composition of the crop in the various compartments. A rough quantitative check of the normality of distribution of the various age groups may be applied to the above data by the French Method of 1883. According to this the volume of the older third of the growing stock and the volume of the middle third should be in the proportion of 5 : 3. Since it takes 150 years in this locality to reach a girth of six feet at breast height, which is prescribed as the exploited girth, the older third of the growing stock will contain the age gradations 100 to 150 years and over, and the middle third will contain the age gradations between 50 and 100 years. According to the rate of growth of the trees in this locality, the three to four and four to five feet girth classes will fall within the 50 to 100 years age class and trees five feet girth or over at breast height will belong to the older third of the growing stock. Accordingly for the data in the preceding statement, the ratio of the volumes between the middle third to the older third is about 15 : 14 whereas for a normal distribution it should 15 : 25. It is apparent that there is a great deficiency in the mature growing stock, mostly due to unregulated exploitation of the valuable big sized trees in the years before the forests came under systematic management. However the presence of sufficient amount of the middle aged growing stock indicates that, if future exploitation is made with due caution by restricting the intensity of fellings to the degree indicated by any recognized and suitable formula for the regulation of yield in irregular forests, the distribution of the various age gradations may be brought very nearly to a state of normality in due course.

500. It will be seen from the data furnished in paragraph 498, that for an area of 10,010 acres of the forest, there are 20,494 trees of 6 feet and over in girth at breast height, among the principal saleable species. There are therefore only about two "exploitable" trees for an acre.

501. The relative distribution of the various saleable timber species, as far as trees of and above 6 feet girth at breast height as computed from the data furnished in paragraph 498 is given below expressed as percentages :—

	PER CENT.	
Teak	30	Proportion among the six saleable timber species of the locality in the areas enumerated.
Mathi	41	
Vengai	5	
Venteak	12	
Rosewood ..	4	
Grewia	8	

502. A scrutiny of the statement given in paragraph 498 would reveal that the stock of teak is more in the compartments of Teppakadu block than those in Benne Block. In some of the compartments of Benne Block there is only an occasional teak. General observations of the nature of growth in the field show that there is very little natural regeneration. Even the little that springs up has to contend with the periodical fires that ravage the area, and only the fire hardly species can survive. The presence of heavy growth of grass, which gets firmly established after repeated fires, is another factor to be reckoned with regarding the difficulty in the establishment of the natural regeneration of the timber species.

Section 4—Method of treatment.

503. The problems and difficulties in the management of the Mudumalai forest, briefly stated, are as follows :—

(i) The forest had been degraded by the unregulated fellings in the past, i.e., prior to the year 1910. In 1910 the forests were brought under systematic working under a regular working plan.

(ii) Extensive areas are swept over by ravaging fires annually.

(iii) The presence of considerable amount of grass makes the damage by fire more disastrous and the establishment of the natural regeneration of the tree species more difficult.

(iv) The number of saleable species is limited and by them, teak which is very valuable had been mainly exploited in the past.

(v) Natural regeneration of the timber species is very little.

(vi) There is deficiency in the mature growing stock due to the irregulated felling in the early days of the history of Mudumalai Forests.

504. It, therefore, becomes necessary that the working of the Mudumalai Range forests in future should be confined to the removal of the mature and overmature trees to the extent permissible under systematic management for a sustained yield. The fellings should be so regulated that the growth of grass is not encouraged. The subsidiary silvicultural operations will aim at stimulating the growth of saleable timber species.

505. The method of treatment proposed will be (i) to do selection fellings of mature and overmature trees in accordance with silvicultural principle and management considerations and (ii) to carry out subsidiary silvicultural operations for the improvement of the crop.

506. *Exploitable size.*—Trees of and above six feet in girth at breast size will be exploited subject to the conditions given in paragraphs 516 and 522.

507. *Choice of species.*—The common saleable species at present are *Tectona grandis, Terminalia tomentosa, Pterocarpus marsupium, Lagerstroemia lanceolata, Dalbergia latifolia* and *Grewia tiliaefolia*. If there is a demand for any other species, it may also be marked for felling if it is of the exploitable size. There is an increasing demand for *Bombax malabaricum*.

508. *Silvicultural System.*—The silvicultural system adopted for this working circle will be the selection system.

509. *Rotation.*—It takes 150 years for the principal timber species of the locality to reach the exploitable size of six feet girth at breast height under natural forest conditions. The rotation therefore, is fixed at 150 years.

510. *Felling cycle.*—A felling cycle of 30 years will be adopted, there being 30 compartments in this working circle. One compartment will be taken up for working each year and the compartments will be gone over five times during the rotation. It also takes 30 years normally for the immediately below girth class (five to six feet) to pass over the exploitable girth class, and hence during the felling cycle most of the immediately below girth class will pass into the exploitable girth class by the time a compartment which had exploited is taken again for working.

511. *Yield.*—The yield will be regulated by area and by the number of exploitable trees as determined by Smythies Safeguarding Formula Method applicable to the irregular forest worked under selection system.

512. The number of trees of exploitable size in the ten compartments prescribed for working during the period of this plan is 20,494 and the number of trees in the girth class immediately below the exploitable girth class is 30,392. Using the symthies safeguarding formula $Y = \frac{x}{1 \text{ plus } X/2} \times 100$ where Y is the yield that can be safely removed expressed as percentage of the number of exploitable size trees, I = the number of exploitable size trees and $X = \frac{f}{t}$ (II—Z% of II) where, f = felling cycle, t = the time taken normally for the girth class immediately below the exploitable size girth class to reach the exploitable size girth class II = the number of trees in the girth class immediately below the exploitable size girth class and Z = the percentage of II failing to reach the exploitable size in "t" years. Substituting the corresponding values in the formula, viz., I = 20494, II = 30392, f = 30, t = 30 and Z = 10 the value of Y for the data in question will be $\frac{27353}{20494 \text{ plus } 13677} \times 100$ or 80 per cent. In other words 80 per cent of the exploitable size alone can be removed safely if future supplies are to be on more or less sustained basis.

513. The number of exploitable size trees that are available in the ten compartments to be worked during the period of this plan is 20494 the maximum number that can be safely exploited during the ten years of this plan from the sustained yield point of view will therefore be 4/5 × 20494 or 16,395 trees (approximately equivalent to six lakhs of cubic feet of timber). Since the area of the compartments to be worked annually vary in size and the distribution of the exploitable size trees vary, from compartment to compartment the annual yield will naturally vary. The number of exploitable size trees that will be removed also depends on the marking which will be governed mainly by silvicultural considerations.

514. As the composition of the crop varies from compartment to compartment, it is not possible to restrict the maximum number of trees for each species nor would it be practicable as the marking had to be carried out mainly on silvicultural grounds. The restriction therefore will be only on the total number of exploitable trees that can be removed in each compartment. The tabular statement given in paragraph 522 furnishes the maximum number of trees that can be marked for felling in each compartment.

Section 5—Method of executing the fellings.

515. The marking, felling and extraction of timber will be done departmentally.

516. The rules regulating the marking of trees for selection felling will be—

(i) Only trees of and above six feet in girth over bark at breast height will be marked.

(ii) The species to be normally marked are teak, mathi, vengai, venteak, rosewood and grewia. Bombax is occasionally found and it can also be marked. If demand arises for any other species, the District Forest Officer may order such species also to be included for marking.

(iii) Marking of exploitable size trees will be carried out in such a way that no two trees are removed within one chain of each other.

(iv) When exploitable size trees are retained for silvicultural or other reasons, the better tree with vigorous growth and good shape will be retained and overmature or badly shaped or moribund or diseased trees of exploitable size will be marked.

(v) No tree should be marked if it would cause a lasting gap in the conopy for a consideration time and encourage the growth of grass.

(vi) All dead trees irrespective of their girth will be exploited if they are saleable.

(vii) The total number of " exploitable size " trees that is finally removed shall not exceed the number indicated for each compartment in the statement in paragraph 522.

517. All saleable trees marked for felling will be blazed and serially numbered. The numbering will be done in two places both at the breast height and near the collar so that the number may be available both on the felled tree and the stump. At the time of marking, the girth of the tree over the bark at breast height and the estimated length of the merchantable bole will be noted. The probable volume of the outturn will be obtained from any of the quarter-girth volume tables using a reducting factor 0·6. The marking and numbering should be completed before the end of January preceding the year of working.

518. The period for working each compartment is one year commencing from the 1st of April of the allotted year. The felling will commence early in April and completed as quickly as possible.

519. The trees converted into logs will be classified and graded as detailed in paragraph 144 (Chapter III, Part I). Rosewood logs will be rough squared at site before being transported to; the other logs will be transported as round logs. When the labour position improves in Mudumalai Range, rough squaring at site of teak or other logs may be undertaken. The volume of the logs will be calculated by the quarter girth formula $(g/4)^2 \times l$ where g is the mid-girth of the log and I is length.

520. The converted timber will be dragged by the departmental elephants to the forest depot. In order to arrange the dragging economically as well as to avoid as far as possible uphill dragging, it may be necessary to have more than one forest depot.

521. Such classes of timber as are considered not worth transporting to Nanjangud Sale Depot should be dragged to roadside depots and sold before the 15th of January annually. All roadside depots should be specially fire protected by clearing and burning a 25 feet fire line around them and ensuring that this fire line is swept clean of all growth once a month in March, April and May.

Section 6—Tabular Statement of Fellings.

522. The compartments to be worked during the period of this plan, the years in which they would be exploited and the maximum number of exploitable size trees that could be removed are shown in the following Statement :—

Year of working.	Block and compartment number.	Acreage included in this working circle.	Maximum number of exploitable size trees that can be felled.	Remarks.
1954–55 ..	Teppakadu—1 ..	1,057	1,174	There is no obligation that " exploitable size " trees to the maximum number indicated in the preceding column should be felled to that extent. Marking for felling will be mainly on silvicultural grounds and the limit placed is only to prevent over exploitation. The number of trees marked may be less than the number indicated but in no case can exceed it.
1955–56 ..	Benne—32 ..	790	1,433	
1956–57 ..	Teppakadu—2 ..	831	1,662	
1957–58 ..	Benne—33 ..	974	1,460	
1958–59 ..	Teppakadu—3 ..	1,007	1,477	
1959–60 ..	Benne—37 ..	1,158	2,316	
1960–61 ..	Teppakadu—4 ..	1,191	2,382	
1961–62 ..	Benne—35 ..	1,207	1,135	
1962–63 ..	Teppakadu—11.	929	1,072	
1963–64 ..	Benne—34 ..	866	1,425	

NOTE.—Benne 31 was worked in 1953-54.

523. The compartments to be worked in the succeeding five years in case the revision of the plan is not undertaken in time, are indicated below :—

Year of working.	Block and compartment number.	Area included in this working circle.
1964–65	Teppakadu—10	808
1965–66	Benne—36	1,204
1966–67	Mudumalai—15	1,568
1967–68	Mudumalai—16	1,227
1968–69	Mudumalai—17	905

524. The probable yield that may be expected from this working circle during the period of this plan is indicated below based on the results of the 10 per cent stratified random sampling enumeration carried out at the time of the preparation of this plan :—

Year.	Block and compartment number.	Total yield in cubic feet.
1954–55	Teppakadu—1	42,412
1955–56	Benne—32	52,799
1956–57	Teppakadu—2	59,832
1957–58	Benne—33	53,559
1958–59	Teppakadu—3	53,887
1959–60	Benne—37	83,376
1960–61	Teppakadu—4	87,752
1961–62	Benne—35	42,028
1962–63	Teppakadu—11	39,205
1963–64	Benne—34	47,969
	Total	562,819

Section 7—Subsidiary Silvicultural Operations.

525. The main object of the subsidiary silvicultural operations are (i) to assist and establish regeneration, in the openings caused by the fellings, (ii) to tend the advance growth of the valuable species and (iii) to relieve from suppression the future valuable stems.

526. These operations will be carried out in each of the compartments taken up for selection fellings in the same year in which the fellings take place so that the work done may be carried out under constant check.

527. Deleted.

528. The subsidiary silvicultural operations to be carried out are—(i) cutting back of badly shaped, moribund or damaged teak saplings which are below 12 inches in girth at breast height, (ii) freeing from suppression advance growth and young trees of teak and other saleable species which are below a height of 25 feet ; old stems do not respond to tending ; it is not necessary to make large scale removals of other useless species by cutting them off completely, for in most cases the cutting of a branch or two, would be sufficient to relieve the crown of the suppressed stems ; it must be remembered that none of the stems of the saleable species should be sacrificed during these operation one in preference to another ; only inferior species of no economic importance can be cut or their branches lopped and that too, only if they are actively interfering with a valuable future tree which can respond to the tending ; no felling of large trees of any species is involved in this cultural work normally as any big opening of the conopy will promote the growth of grass and increase the fire hazard ; (iii) climbers will be cut whenever found on any of the saleable timber species ; (iv) where there are many coppice shoots from the same stool of any of the saleable timber species, they will be thinned out to one or two stems per stool according to the size of the coppice shoots.

529. The areas where the subsidiary silvicultural operations referred to above, are those indicated in paragraph 522.

530. In the succeeding five years in case in revision of the plan is not taken up in time, the areas where the subsidiary silvicultural operations are to be carried out will be those indicated in paragraph 523.

Section 8—Other Regulations.

531. It is necessary that the compartment and block lines are kept cleared always. Block lines will be cleared once in a year as a sanctioned work but the compartment lines can be kept in good condition by the concerned beat subordinates ; whenever they find any coppice springing up on the lines they should cut it back.

532. The compartment boards should be renewed every year in April, in all cases where such renewal is found necessary. The compartment boards should indicate the number of the compartment and the year in which they were last worked.

533. Instead of compartment boards stone slabs containing the necessary details chiselled on them may be planted in the salient corners, whenever possible, so that the cost of renewal of boards may be avoided.

534. *Control.*—The control forms relating to this working circle should be posted soon after the close of each financial year.

CHAPTER VI.

WORKING PLAN FOR THE TEAK WORKING CIRCLE.

Section 1—General constitution of the Working Circle.

535. The Teak Working Circle includes all the existing teak plantations in Mudumalai and Sigur ranges (mostly in Mudumalai range) and the areas proposed for conversion into teak in due course.

536. The area of this working circle is 1,981·51 acres, of which the area already under teak plantation is 1,153·01 acres. The rest of the area is destined for conversion in due course.

Section 2—Blocks and compartments.

537. The following statement gives particulars of the existing plantations :—

Number.	Block and compartment number.	Name of the plantation.	Year of plantation.	Average.
1	Benne 29 and 30	Benne	1863–75	42·25
2	Benne—32	Benne Tuckle I	1907	2·75
3	Benne—33	Benne Tuckle II	1907	5·60
4	Benne—32	Benne Tuckle III	1917	13·00
5	Mudumalai—26	Mudumalai	1869–75	22·25
6	Mudumalai—20	Inandakere Tuckle	1926	11·00
7	Teppakadu—3	Experiment plot on Mysore road	1916	3·00
8	Teppakadu—4	Experiment plots of Mudumalai-Thorapalli road.	1918	5·36
9	Teppakadu—8	Teppakadu I	1922	20·00
10	Teppakadu—1	Kargudi I	1924	20·00
11	Teppakadu—1	Kargudi II	1924	90·00
12	Teppakadu—1	Kargudi III	1925	59·50
13	Teppakadu—3	Bidhurhalla I	1926	11·00
14	Teppakadu—3	Bidhurhalli Tuckle	1926	4·00
15	Tappakadu—6	Cheenakolli I	1926	10·00
16	Teppakadu—6	Cheenakolli II	1927	10·00
17	Teppakadu—4	Nellikere I	1928	12·50
18	Teppakadu—6	Cheenakolli III	1929	15·00
19	Teppakadu—6	Cheenakolli IV	1930	22·50
20	Teppakadu—4	Nellikere II	1931	31·00
21	Teppakadu—6	Cheenakolli V	1932	40·00
22	Teppakadu—6	Cheenakolli VI	1933	14·50
23	Teppakadu—6	Cheenakolli VII	1934	21·00
24	Teppakadu—4	Nellikere III	1935	33·00
25	Teppakadu—4	Nellikere IV	1936	31·00
26	Teppakadu—4	Nellikere V	1937	26·00
27	Teppakadu—2	Kargudi IV	1938	19·00
28	Teppakadu—2	Kargudi V	1939	19·00
29	Teppakadu—2	Kargudi VI	1940	21·00
30	Teppakadu—2	Kargudi VII	1941	19·00
31	Teppakadu—1	Kargudi VIII	1941	15·00
32	Teppakadu—9	Teppakadu II	1941	17·00
33	Teppakadu—2	Kargudi IX	1942	17·00
34	Teppakadu—2	Kargudi X	1942	31·00
35	Mudumalai—19	Ombetta I	1942	21·00
36	Teppakadu—6	Cheenakolli VIII	1943	11·00
37	Mudumalai—19	Ombetta II	1943	21·00
38	Mudumalai—18	Ombetta III	1943	21·00
39	Mudumalai—18	Ombetta IV	1944	38·00
40	Mudumalai—19	Ombetta V	1944	18·20
41	Mudumalai—20	Ombetta VI	1948	22·00
42	Teppakadu—3	Bidhurhalla II	1949	23·50
43	Teppakadu—3	Bidhurhalla III	1950	25·00

Number.	Block and compartment number.	Name of the plantation.	Year of plantation.	Acreage.
44	Teppakadu—3	Bidhurhalla IV	1951	25·00
45	Teppakadu—3	Bidhurhalla V	1952	18·10
46	Mudumalai—19	Ombetta VII	1952	25·25
47	Teppakadu—3	Bidhurhalla VI	1953	22·25
48	Teppakadu—14	Coppice area	1923	25·00
49	Teppakadu—1	Coppice area	1924	57·00
50	Teppakadu—3	Coppice area	1926	25·00
51	Teppakadu—10	Coppice area	1931	5·00
52	Teppakadu—13	Experimental plot on Masinagudi road.	1953	5·00
			Total	1,153·00

538. Among the above, most of the plantations lie in Teppakadu Block. As the labour and transport position improves, the future plantations may have to be located along Benne-Mukkatti road, as the rate of growth of teak in that part of Mudumalai range is better than in Teppakadu Block. However, for the present further teak planting will have to be continued in the suitable areas in Teppakadu Block, mostly in the vicinity of Mysore-Gudalur road as conditions, for satisfactory formation and proper care of plantations, are now obtainable only in that locality.

539. The plantations vary widely in density of stocking and rate of growth. A description of each of them will be found in Appendix XV.

540. Detailed maps of the teak plantations on a scale of 4 inches to a mile accompany the working plan.

Section 3—Analysis of the crop.

541. Teak planting in this division was commenced as early as 1863 but there had been no continuity in the planting programme. Teak planting had been done annually and continually from the year 1924. During the world war II due to the occupation of the Mudumalai forests by the Military Camp there had been no planting in the years 1945, 1946 and 1947.

542. The area to be converted into teak during the period of this plan and the few years immediately following it, lie mostly in compartment 5 of Teppakadu Block. The type of forest contained therein, is of the mixed deciduous type containing the principal timber species of South India; the undergrowth is mainly wild arrowroot mixed with Strobilanthes and Eupatorium. Lantana is also found in patches where the canopy is not very dense. The soil is of a blackish loam variety and is well drained. The drainage is towards Bidhurhalla or the Moyar. A few scattered swampy patches are found which will be excluded while teak is planted.

543. The area proposed for conversion has been enumerated by adopting the stratified random sampling method on a ten per cent basis. The distribution of the growing stock in compartment 5 of Teppakadu block, as computed from the sampling results is given below :—

Girth class in feet.	*Teak.*		*Venteak.*		*Grewia.*	
	Number of trees.	*Merchantable volume in cubic feet.*	*Number of trees.*	*Merchantable volume in cubic feet.*	*Number of trees.*	*Merchantable volume in cubic feet.*
2—3	708	3,540	1,164	6,984	744	3,720
3—4	1,316	11,844	960	10,560	1,476	14,760
4—5	1,082	17,230	696	11,832	1,968	31,488
5—6	684	15,048	672	16,128	1,488	35,712
6—7	336	10,752	216	6,912	516	15,480
7 and over.	108	4,624	204	8,364	120	6,000
Total ..	4,234	63,038	3,912	60,780	6,312	107,160

	Mathi.		*Rosewood.*	
	Number of trees.	*Merchantable volume in cubic feet.*	*Number of trees.*	*Merchantable volume in cubic feet.*
2—3	1,236	8,652	216	1,296
3—4	1,776	21,313	144	1,584
4—5	1,332	22,644	204	3,468
5—6	1,020	25,500	180	4,860
6—7	482	17,870	132	4,224
7 and over.	300	14,100	36	1,440
Total ..	6,145	110,078	912	16,872

544. All suitable areas in compartment 5 of Teppakadu will be planted with teak before any other compartment is taken up for conversion.

Section 4—Method of treatment.

545. In view of the preferential exploitation of teak from the forests of Mudumalai Range, the quality of teak had been reduced. Since the probability of teak becoming more and more scarce in the area is only a matter of time, if adequate teak planting is not done, it is proposed to plant about 30 acres with teak annually, so that the production of teak may be maintained on a sustained basis. Though it is true that the factors of the locality are not such as to produce teak of good quality, in view of the deficiency of natural regeneration to replace the growth removed by selection fellings, it is necessary to have compensatory plantations in the locality. Teak is the most valuable timber species which occurs in this forest, and a teak plantation formed in this locality even if it is inferior quality, is much more valuable than the mixed crop it replaces and the cost of such plantation is more than covered by the revenue realized by the sale of the existing standing growth, not to speak of the increased revenue in future.

546. The treatment proposed is to take up annually an area of about 30 acres, clearfell an exploit all valuable produce, burn the remaining slash and plant up the area with teak.

547. *Silvicultural System.*—The silvicultural system adopted in this working circle is the clear-felling system whereby a mixed selection forest clearfelled and converted into even-aged teak forest with a complete series of age gradations by concentrated artificial regeneration. In the case of Benne and Mudumalai plantations which will be felled in the years 1955–56 and 1957–58 it will be a case of replacement of mature plantation by fresh planting after clearfelling.

548. *Rotation.*—In respect of " top height " Mudumalai Teak plantations mostly correspond to All-India Mean IV quality. However the diameter increment of these plantations show a rise from the Mean IV to I/II level from the 15th year to the 25th year and thereafter more or less correspond to I/II level (All-India Yield Teak Tables). Anyway we do not have very many older plantations to know, whether there will be a fall or steady maintenance of the diameter increment. There is, however, good reason to believe that the diameter sizes that we can obtain from Mudumalai teak plantation at the rotation age will be definitely greater than the figures given for the Mean IV quality in the All-India Table.

549. The two considerations that would weigh as regards the fixation of the rotation in this case are : (i) the average sizes that would be required by the market and the age to which the crop will have to be grown to attain such sizes ; and (ii) the age of culmination of the rate of mean annual increment in respect of volume.

550. According to the figures of the All-India Yield Table, the Mean Annual Increment would culminate for the Mean IV quality beyond 80 years. Since the All-India Tables had been constructed from old data collected from crops often underthinned according to the present ideas, it may be safely assumed that with the present treatment of relatively heavy thinnings exploitation can be taken a decade earlier. In view of the fact the diameter increment is increasing at a higher rate than the Mean IV quality, even a little faster height growth is capable of making a greater contribution to the volume increment. From the rate of diameter increment, it is apparent that at an age of 70 years, quite a good many logs from 5 to 6 feet girth can be obtained. Since there is no appreciable height increment in this locality, any longer rotation will not be financially worthwhile.

551. Taking the different aspects of the case into consideration, the rotation of the teak plantations in the locality is fixed at 70 years.

552. *Choice of species.*—Teak will be introduced over the entire clearfelled area. In the case of small swampy patches occurring locally, terminalia tomentosa seedlings may be planted. Any mixture of species naturally occurring in the teak plantations will be preserved during the tending operations as a measure of entomological control of teak defoliators, provided those species do not interfere with teak in any manner.

Section 5—Method of Executing the Fellings.

553. All plantations which are to be felled will be exploited departmentally.

554. All areas which are to be clearfelled for conversion into teak will be exploited through the agency of contractors. The area will be surveyed and offered for sale in open auction. The period of lease will be nine months from the 1st of April to the 31st of December of the allotted year. The area will be completely clearfelled of all growth and all the utilizable produce available from the area will be removed by the contractor.

555. In case no suitable purchaser of the coupe is forthcoming, the saleable species should be exploited departmentally before the end of August and the remaining miscellaneous growth sold in auction subsequently for clearfelling on a four-month lease commencing from the 1st of September.

556. All saleable species in the areas to be converted into teak will be enumerated and numbered after blazing. The girth of the tree at breast height over the bark will be measured and the probable merchantable bole length estimated. The volume of the probable outturn may then be estimated from any quarter-girth volume tables using an average form factor of 0·6.

557. The common species marked for felling are teak, mathi, vengai, rosewood, venteak, *Grewia tiliaefolia* and *Bombax malabaricum*. However the District Forest Officer may include any other species for which there is demand.

558. All teak trees above 2 feet girth at breast height will be enumerated. In the case of other species, trees over 3 feet in girth at breast height will be enumerated.

559. The marking and numbering should be completed before the end of January preceding the year of exploitation.

560. In cases where departmental extraction has to be done (as would be the case either where teak plantations are felled or where no suitable purchaser was found forthcoming in the open auction held for clearfelling the areas to be converted into teak) the saleable trees will be felled departmentally commencing from the 1st of April of the allotted year and completed before the end of August. The felling, conversion, classification and dragging will be done in the same way, as indicated in paragraphs 519 to 521.

Section 6—Tabular Statement of Fellings.

561. The following are the areas to be clearfelled for conversion during the period 1954–55 to 1963–64:—

Year of felling.	Block and compartment number.	Area in acres.	Name of the plantation area.
1954–55	Tappakadu 5	30	Thorapalli I.
1955–56	Do.	30	Do. II.
1956–57	Do.	30	Do. III.
1957–58	Do.	30	Do. IV.
1958–59	Do.	30	Do. V.
1959–60	Do.	30	Do. VI.
1960–61	Do.	30	Do. VII.
1961–62	Do.	30	Do. VIII.
1962–63	Do.	30	Do. IX.
1963–64	Do.	30	Do. X.

562. In the years immediately following this plan the rest of the suitable areas in Teppakadu 5 will be clearfelled and planted with teak at the rate of 30 acres annually.

563. The following teak plantations will be taken up for clearfelling in the years indicated below for replanting with teak in the following year :—

Year of felling.	*Block and compartment number.*		*Name of the plantation.*	*Acreage.*
1955–56	Benne	29 and 30	Benne (1863–75) ..	42·25
1957–58	Mudumalai	26	Mudumalai (1869–75) ..	22·25

564. In the case of the clearfelling areas for conversion, on an average the following yield may be expected from the fellings from 30 acres :—

Species.	*Probable outturn in c.ft.*	*Species.*	*Probable outturn in c.ft.*
Teak	2,340	Rosewood	420
Mathi	4,110	Grewia	3,840
Venteak	2,380		

565. In view of the fact that the teak plantations referred to in paragraph 563 had not received proper thinnings in the past, the yield will not be normal. Anyway a total yield of about 1,500 c.ft per acre may be expected from the clearfellings, though most of the yield will be in the form of poles.

Section 7—Regulation of Regeneration Operations.

566. *Clearfelling of unmarketable growth.*—After all saleable material had been removed all the remaining growth should be completely clearfelled. This " rubbish " felling should be completed before end of January, and the slash will be left to dry as evenly scattered over the area as can be arranged cheaply.

567. *Burning.*—The slash will be burnt in February under supervision. The material left unburnt will be billeted, piled in scattered heaps over unburnt patches and reburnt in March. A good burn evenly spread over the area should be aimed at. Before any burning is undertaken in the planting area, a line nine feet wide all round the periphery will be scraped and burnt early in January as a fire protection measure.

568. Aligning and staking at an espacement of 6 feet will be carried out during March. In view of the limitations of the factors of the locality for the successful growing of teak a wider espacement is not possible. For few years a wider espacement of 8½ feet by 8½ feet was tried and found unsuited to the locality. The establishment of a thick growth of lantana in this area is common and it is more difficult to control the pest with widely spaced out teak plants. The generally adopted espacement of 6 feet by 6 feet which had stood the test for many years is therefore prescribed for this area where the site quality is poor. (Mostly of All-India Teak Mean IV quality.)

569. *Planting.*—One year old teak stumps prepared from the nursery raised seedlings will be planted in crowbar holes with the onset of premonsoon showers. For this locality usually the planting season will be from the 15th of April to the 15th of May, depending upon the annual and local variations of rainfall. Replacement of casuality should be done as and when noticed and completed before the end of August.

570. Two inspection paths 12 feet wide (which will serve as internal fire lines also) at right angles to each other will be maintained so as to divide the regeneration area into four parts. The paths must be kept clear by the concerned forest subordinates.

571. No departmental Kumri will be done. However, if any, Kumridar is forthcoming, either from the local Kurubars or from outsiders, the plantation area will be leased out for one or two years from the year of plantation for raising ragi or any other suitable crop in conjunction with the planted teak. The plants will have to be kept weeded to a radius of 1½ feet by the Kumridars throughout the period of the lease. After the lease periods, weedings will be done in the subsequent year if found necessary.

572. *Weedings.*—In areas where no Kumri crop is raised, weedings will be done for the first two years. The first year weedings will be three in number—first weeding in July in strips two feet on either side of the planting lines ; second weeding in September along the same strips but will also include uprootal of lantana over the entire plantation area ; the third weeding will be in January which will be confined to one foot radius round the plant and also include soil working to a depth of three to four inches.

573. In the second year there will be two weedings. The first weeding will be in June along the strips two feet on either side of the planting lines cleared during the first year. The second weeding will be for the backward plants (less than, four feet in height) to a radius of one foot with a soil working to a depth of four to five inches.

574. While weedings take place in the first and the second years, pruning of the double leaders leaving the best stem and cutting of climbers found on the teak stems will be carried out. All damaged teak saplings will be cut back flush with the ground during the weedings.

575. In the third year of the plantation, both in the areas where Kumri crop had been raised and in areas where only departmental weedings had been done, a general tending operation will be carried out, which will include climber cutting and cutting of such of the other species dominating or interfering with the teak.

576. The weedings and the tending prescribed are what are normally required for the plantations in this locality. However in cases where special weedings and tending are required in view of the general backwardness of any plantation, it may be done with the permission of the Conservator of Forests. As the rate of growth of teak in this locality is poor, special care is necessary in the early stages.

577. *Nursery.*—The present nursery at Lower Kargudy will be maintained, changing the location of the beds annually to avoid exhaustion of the soil; for each bed one gunny bag of cow dung or one bag of riversilt will be mixed with soil when the beds are formed. Nursery beds of 40 by 4 will be used. Sowing will be done in April ; 25 lb. of teak seed will be sown per bed, which will be sufficient for planting one acre at 6 feet by 6 feet. The mps" prepared from the nursery seedlings will be used for planting.

578. The following statement gives details of the various operations connected with the different regeneration areas to be carried out during the period of this plan:—

Year.	*Planting area.*	*First year seeding area.*	*Second year weeding area.*	*Third year tending area.*
1954–55	Bidhurhalla VII	Bidhurhalla VII	1953 RAs.	1952 RAs.
1955–56	Thorapalli I	Thorapalli I	Bidhurhalla VII	1953 RA.
1956–57	Thorapalli II Benne	Thorapalli II Benne	Thorappalli II	Bidhurhalla VII.
1957–58	Thorapalli III	Thorapalli III	Thorapalli II Benne	Thorapalli I.
1958–59	Thorapalli IV Mudumalai	Thorapalli IV Mudumalai	Thorapalli III	Thorapalli III. Benne.
1959–60	Thorapalli V	Thorapalli V	Thorapalli IV Mudumalai.	Thorapalli III.
1960–61	Thorapalli VI	Thorapalli VI	Thorappalli V	Thorapalli IV.
1961–62	Thorapalli VII	Thorappalli VII	Thorapalli VI	Thorappalli V.
1962–63	Thorapalli VIII	Thorapalli VIII	Thorapalli VII	Thorapalli VI.
1963–64	Thorappalli IX.	Thorappalli IX	Thorapalli VIII	Thorapalli VII.

579. In the succeeding years, corresponding regeneration operations will be carried out similarly in accordance with the clearing that takes place with reference to the provision contained in paragraph 562 of this plan.

Section 8—Subsidiary Silvicultural Regenerations.

580. *Thinnings.*—In the past early thinnings have been neglected in the case of many plantations. It has to be remembered that the teak is very susceptible in youth not only to suppression but also to competition. Therefore, when in doubt, it is preferable to thin a little early than late, a little heavy than light, the actual intensity of thinning carried out being according to the condition of the crop.

581. For the general rate of growth of the teak in the plantations of the locality and the rotation adopted, thinnings will have to be done in the 6th, 12th, 19th, 27th and 36th years.

582. Due to the poor quality of the teak plantations of the locality, it would not be advisable to have more than one mechanical thinning in the early stages because by the time the crop reaches the second thinning it would be possible to carry out a silvicultural thinning. Further a mechanical thinning from that stage would involve sacrifice of many good stems.

583. The first thinning will be done normally in the sixth year of the plantation. It will be a mechanical thinning which will reduce the stocking by 50 per cent. The thinning will be carried out by removing all the plants in the alternate diagonal rows, by which an espacement of $8\frac{1}{2}$ feet by $8\frac{1}{2}$ feet would result the first thinning has to be mechanical in a normal plantation as the difference between various plants would not be great at this stage and any silvicultural thinning to remove 50 per cent of the stock would not result in a better thinning. However in cases where the condition of the crop does not justify mechanical thinnings, the ordinary thinning on silvicultural considerations will be carried out.

584. The second and subsequent thinnings will be done according to the condition of the crop by selecting on silvicultural considerations the trees to be retained. While marking for thinnings all dead, dying and diseased or moribund trees should be marked for removal. Suppressed stems and dominated stems will also be marked for removal. No removal should cause a lasting gap in the canopy for a considerable time. The intensity of thinnings and the resultant espacement would vary with the age and condition of the crop. However, as a guide to the marking officer for regulating the intensity of thinnings (except for the final thinning) it is suggested that marking may be so done that the thinning results in an average espacement equal to about one-third of the average height of the crop that is being thinned. As there will be no thinning after the 36th year (teak does not respond greatly as it gets old) the stems to be retained at the final thinning will be the stems required for the final crop plus 10 per cent to allow for the natural loss between the final thinning and the rotation age.

585. The following table furnishes the necessary data for normal plantations of the locality in regard to thinnings:—

Name of the thinning.	*Age at the time of thinning.*	*Average height in feet.*	*Normal number of stems per acre after thinning.*	*Average espacement in feet for the crop after thinning.*
First	6	24	605	$8\frac{1}{2}$
Second	12	35	305	12
Third	19	48	195	16
Fourth	37	60	105	22
Fifth (final)	36	70	66	38

It must be borne in mind that the thinnings to be done in any plantation will be purely on silvicultural considerations and that the statement given in the preceding paragraph

is intended mainly as a guide to the marking officer for defining the intensity of thinnings required. The marking for the third, the fourth and the fifth (final) will be done by the District Forest Officer or an Assistant Conservator of Forests, if available. The first and the second thinnings will be carried out by the concerned Range Officer.

586. The following statement gives the areas to be thinned during the period of this plan. If the plantations are normal or had responded normally to the previous treatment they will be thinned according to the data given in paragraph 585. If they do not grow according to the normal expectation, thinning will be done in the allotted year to that intensity required by the condition of the crop. In view of the irregularity of the past thinnings, it will take few more years before things are brought to a normal state of affairs as regards thinnings.

Year of thinning.	Name of the plantation.	Block and compartment number.		Area in acres.
1954–55	Ombetta VI (1948) ..	Mudumalai	20	22·00
	Kargudy IX (1942) ..	Teppakadu	2	17·00
	Kargudy X (1942) ..	Teppakadu	2	31·00
	Ombetta I (1942) ..	Mudumalai	19	21·00
	Nellikere III (1935) ..	Teppakadu	4	33·00
	Cheenakolli II (1927) ..	Teppakadu	6	10·00
	Experimental plots Mudumalai-Thorapalli Road (1918).	Teppakadu	4	5·36
	Experimental plots on Mysore Road (1916).	Teppakadu	3	3·00
	Benne tuckle II (1917) ..	Benne	32	13·00
	Benne tuckle I (1907) ..	Benne	32	2·75
	Benne tukcle II (1907) ..	Benne	33	5·60
		Total ..		163·71
1955–56	Bidhurhalla II (1949) ..	Teppakadu	3	23·50
	Cheenakolli VIII (1943) ..	Teppakadu	6	11·00
	Ombetta II (1943) ..	Mudumalai	19	21·00
	Ombetta III (1943) ..	Mudumalai	18	21·00
	Nellikere IV (1936) ..	Teppakadu	4	31·00
	Nellikere I (1928) ..	Teppakadu	4	12·50
		Total ..		120·00
1956–57	Bidhurhalla III (1950) ..	Teppakadu	3	25·00
	Ombetta IV (1944) ..	Mudumalai	18	38·00
	Ombetta V (1944) ..	Mudumalai	19	18·20
	Nellikere V (1937) ..	Teppakadu	4	26·00
	Cheenakolli III (1929) ..	Teppakadu	6	15·00
		Total ..		122·00
1957–58	Bidhurhalla IV (1951) ..	Teppakadu	3	25·50
	Kargudy IV (1938) ..	Teppakadu	2 ..	19·00
	Cheenakolli IV (1930) ..	Teppakadu	6	22·50
		Total ..		67·00
1958–59	Bidhurhalla V (1952) ..	Teppakadu	3 ..	18·10
	Ombetta VII (1952) ..	Mudumalai	19	25·25
	Kargudy V (1939) ..	Teppakadu	2	19·00
	Coppice Area (1931) ..	Teppakadu	10	5·00
	Nellikere II (1931) ..	Teppakadu	4	31·00
	Kargudy I (1922) ..	Teppakadu	1	20·00
	Theppakadu I (1922) ..	Teppakadu	8	20·00
		Total ..		138·35
1959–60	Bidhurhalla VI (1953) ..	Teppakadu	3	22·50
	Experimental plot on Masinagudi Road (1953).	Teppakadu	13	5·00
	Kargudy VI (1940) ..	Teppakadu	2	21·00
	Cheenakolli V (1932) ..	Teppakadu	6	40·00
	Coppice Area (1923) ..	Teppakadu	14	25·00
		Total ..		113·50

Year of thinning.	Name of the plantation.	Block and compartment number.		Area in acres.
1960–61	Bidhurhalla VII (1954) ..	Teppakadu	3	23·50
	Ombetta VI (1948) ..	Mudumalai	20	22·00
	Theppakadu II (1941) ..	Teppakadu	9	17·00
	Kargudy VIII (1941) ..	Teppakadu	1	15·00
	Cheenakolli VI (1933) ..	Teppakadu	6	14·50
	Kargudy II (1924) ..	Teppakadu	1	90·00
	Coppice Area (1924) ..	Teppakadu	1 ..	57·00
		Total ..		239·00
1961–62	Thorapalli I (1955) ..	Teppakadu	5	30·00
	Bidhurhalla II (1949) ..	Teppakadu	3	23·50
	Kargudy IX (1942) ..	Teppakadu	2	17·00
	Kargudy X (1942) ..	Teppakadu	2	31·00
	Ombetta I (1942) ..	Mudumalai	19	21·00
	Cheenakolli VII (1934) ..	Teppakadu	6	31·00
	Kargudy III (1925) ..	Teppakadu	1	59·50
	Inandekere Tuckle (1925)	Mudumalai	20	11·00
		Total ..		224·00
1962–63	Thorapalli II (1956) ..	Teppakadu	5	30·00
	Benne (1956) ..	Benne	29 and 30	42·25
	Bidhurhalla III (1950) ..	Teppakadu	3	25·00
	Cheenakolli VIII (1943)	Teppakadu	6	11·00
	Ombetta II (1943) ..	Mudumalai	19	21·00
	Ombetta III (1943) ..	Mudumalai	18	21·00
	Nellikere III (1935) ..	Teppakadu	4	33·00
	Coppice Area (1926) ..	Teppakadu	3	25·00
	Bidhurhalla I (1926) ..	Teppakadu	3	11·00
	Bidhurhalla tuckle (1926).	Teppakadu	3	4·00
	Cheenakolli I (1926) ..	Teppakadu	6	10·00
		Total ..		233·25
1963–64	Thorapalli III (1957) ..	Teppakadu	5	30·00
	Bidhurahalla IV (1951) ..	Teppakadu	3	25·50
	Ombetta IV (1944) ..	Mudumalai	18	38·00
	Ombetta V (1944) ..	Mudumalai	19	18·20
	Nellikere IV (1936) ..	Teppakadu	4	31·00
	Cheenakolli II (1927) ..	Teppakadu	6	10·00
		Total ..		152·70

587. The plantations referred to above should be taken up for thinning in the year allotted and thinned according to the condition of the crop.

Section 9—Other Regulations.

588. Every plantation should carry at the salient corners of its periphery conspicuous plantation boards showing the calender year of its formation and the acreage. Such of these boards, that require replacement will be renewed in the month of April every year.

589. The actual area of each of the plantations that are formed during the period of this plan should be found by actual survey of the planted area. The map of each plantation formed will be made on a scale of 8 inches to a mile and filed with the control journal so that it may be of use during the next revision of the plan.

590. A plantation journal will be maintained for each plantation, wherein the name of the plantation, its location, area, the nature of previous growth, the revenue obtained by the clearing of that growth, the details and cost of formation of the plantations and further history of the plantation will be recorded.

591. *Control.*—The control forms relating to this working circle should be posted soon after the close of every financial year.

CHAPTER VII.

WORKING PLAN FOR THE SANDALWOOD WORKING CIRCLE.

Section 1—General Constitution of the Working Circle.

592. The Sandalwood Working Circle includes all sandal areas in the reserves and the unreserves of Coonoor and Sigur ranges. The sandal bearing area in the unreserves is relatively small and it is considered convenient to exploit them together with the contiguous reserves.

593. The sandal bearing areas had been marked on the stockmaps accompanying this plan. The stockmapping was done by stratified systematic sampling on a ten per cent basis. The sandal areas had been shown in three densities, namely, (i) Dense—25 sandal trees and over per acre; (ii) sparse—10 to 24 sandal trees per acre and (iii) scattered—below 10 sandal trees per acre. The presence of spike had been indicated wherever it was noticed.

594. This working circle has an aggregate area of 88,824 acres, of which the effective sandal area forms only 13,861 acres. The balance area is included on account of the occasional occurrence of sandal as well as for the need of adopting natural features as boundaries.

595. *Felling series.*—Two felling series had been constituted under this working circle. The Connoor Felling Series lies in Coonoor Range and the Sigur Felling Series lies in Sigur Range.

596. The following statement gives details of the two felling series :—

Number and name of the reserves and unreserves included.	Name of the felling series.	Total gross area in acres.
Coonoor Range.		
1 Arakodu and Kokodu	Coonoor	2,335
2 Burliyar	....	179
3 Benhope I and II	....	68
4 Cliff	....	33
5 Hiriyashige	....	1,771
6 Hulikal	....	432
7 Konakare Slopes	....	2,023
8 Kolakombai	....	725
9 Lambsrock	....	32
10 Melur Slopes	....	918
11 Nilgiris Eastern Slopes	....	4,787
12 Rangaswamy Peak	....	816
13 Thattapallam	....	47
		14,166
Sigur Range.		
1 Avaraihalla	....	6,681
2 Bokkapuram	....	4,083
3 Kalhatti	....	6,350
4 Kalmalai	....	937
5 Moyar	....	6,509
6 Northern Hay	....	640
7 Sigur	....	47,244
8 Singara	....	2,214
		74,658

597. The limits of the coupes have been shown in the maps accompanying this plan.

598. The Coonoor Felling Series covers the whole of Rangaswami Peak reserve, Nilgiris Eastern Slopes (part) lying between the Moyar and the path from Kallampalaiyam to Sirur (via) Halimoyar, Arakodu and Kokodu unreserves, the whole of Thattapallam, Cliff, Konakare Slopes, Benhope I and II and Burliyar reserves, a bit in the Lambsrock reserve lying south of the railway line, a bit of the Hulikal reserve adjoining the Conoor river, the whole of Kolakombai, Melur Slopes and Hiriyashige reserves and the unreserves of Hiriyashige.

599. The Sigur Felling Series is bounded on the north by the Moyar, on the east by the eastern boundary of Sigur Range and on the south by the southern boundary of Sigur Ranges. The western boundary of the series is a streamlet till it meets the northern boundary of the Northern Hay reserve, then the reserve boundary of the Northern Hay

reserve till it meets the Sigara stream, then the southern and eastern boundaries of the Moyar reserve up to the junction of Moyar reserve and Avaraihala reserve boundaries and then a streamlet rising near △ 3204 and running northwards to the Moyar.

Section 2—Analysis of the crop.

600. The sandal in the tract dealt with is widely scattered either as isolated stems or in small patches. Enumeration of the crop had been made a 10 per cent basis by stratified systematic sampling. While enumerating the number of spiked, dead and healthy sandal trees, in the enumerated strata were noted. On the basis of the 10 per cent enumeration it is found that nearly 3 per cent of sandal trees in Coonoor Range and nearly 7 per cent sandal trees in Sigur Range are spiked and about 17 per cent in each range are dead. Though the spike disease of sandal in this tract is not in an epidemic form, there appears to be no reason to disbelieve that the spike disease is endemic in the area and it had been continually prevalent to some extent or other ever since it was first observed in 1928 in this division.

601. The results of the enumeration done indicate that the following is the growing stock of sandal in the areas included under the two different feeling series :—

Number and name of the felling series.	Number of Sandal trees in the area.			
	Healthy.	Spiked.	Dead.	Total.
1 Coonoor	36,611	1,373	7,780	45,764
2 Sigur	152,051	16,219	34,464	202,734
	188,662	17,592	42,244	248,498

602. It is seldom that a sandal tree over 10 inches diameter at breast height is found in this tract. Speaking generally, the growing stock of sandal in this area is predominantly young. Spike is prevalent in both the ranges. Spike which had not been found to occur in Coonoor Range, when the last working plan was made, is now found to be much prevalent in Coonoor Range.

Section 3—Method of treatment.

603. Only dead trees over three inches in girth at breast height will be extracted. No living tree, whether spiked or not, will be extracted. Moribund trees will also be excluded from exploitation.

604. Natural regeneration will be relied upon to restock the forests with sandal. The existing growing stock of sandal in each coupe will be tended during the time of extraction of dead sandal. No measures of artificial regeneration of sandal will be provided in this plan, as there is no meaning in frittering away money and energy in that direction in an area where the spike is endemic. Past efforts at artificial regeneration of sandal, though they were on a small scale, have not been very successful.

605. *Felling cycle.*—Since the aim is to exploit only the dead sandal, it is necessary to cover each coupe as frequently as possible so that there may be the least likelihood of theft. Further the tending of the sandal growing stock should be done at short intervals, and such tending is contemplated only when each coupe is taken for exploitation. A short felling cycle is, therefore, necessary. A felling cycle of three years is, therefore, prescribed taking into account the extent of area to be covered annually. For the extraction of dead sandal trees in vulnerable areas the felling cycle should be two years.

606. *Division into coupes.*—Each felling series had been divided into three annual coupes, with the natural features and easily recognizable marks as their boundaries.

607. *Yield.*—The yield will be regulated by area since the outturn of sandalwood depends entirely on the amount of dead trees found at the time when the coupe is due for working, no accurate forecast can be made regarding the annual output. The yield depends on natural causes as well as on the virulence of the dealing death spike on the sandal. However, on the basis of the past yields, it may be expected that an outturn of about 33 tons per annum may be expected for the whole division, about 30 tons from Sigur Range and about 3 tons from Coonoor Range.

Section 4—Method of executing the fellings.

608. *Regulation of working.*—The regulation of working will be entirely by area, one coupe in each series being worked annually, irrespective of outturn. The sequence in which the coupes have to be worked is indicated in paragraph 611. In the event of any arrears in exploitation of the coupe prescribed for the year, the portion not worked over will be taken

up for exploitation during the succeeding year together with the coupe prescribed for that year. In no case will the coupe of any year be withheld from exploitation for the reason that the arrears of the previous year are available for exploitation in lieu of the prescribed coupe.

609. *Fellings.*—Only completely dead trees over 3 inches in girth at breast height will be extracted. All such trees occurring in the coupe of the year will be enumerated and uprooted for extraction of the sandalwood. Dead trees below 3 inches in girth need not be marked, felled or uprooted. No living tree, whether spiked or not, will be felled or uprooted. All fallen branches and stems of sandalwood above 3 inches in girth from the butt end, lying in the coupe at the time of exploitation will also be collected. Marking, uprooting and extraction will be carried out departmentally according to the official pamphlet entitled, "Rules regarding Selection, Felling, Cleaning, Classification and Disposal of Sandalwood, and the Method of Maintaining Depot Accounts and other Registers".

610. The sandal trees extracted from the coupes will be rough cleaned in this division and transported to Satyamangalam Sandalwood Depot of Coimbatore North Division for final cleaning and sale. The revenue realized in Coimbatore North Division by the sale of the sandalwood sent from this division will be credited to the revenues of this division.

Section 5—Tabular Statement of Fellings.

611. The following statement shows the coupes in each felling series that are to be worked each year :—

Year.	*Name and number of the coupe.*	*Total area in acres.*	*Effective area in acres.*	*Boundaries.*
		COONOOR RANGE.		
		Coonoor Felling Series.		
1955–56. .. 1958–59. 1961–62. 1964–65. 1967–68.	Coonoor I ..	5,603	744	*Bit I—North*—Northern boundary of Rangaswamy peak reserved forest. *East*—Part of the district boundary on the east. *South*—Part of the streamlet from △ 5224. *West*—Part of the streamlet from △ 5224 and the streamlet to Pattikombaipallam from △ 5224. *Bit II—North*—Part of the Moyar. *East*—Kotagiri halla. *South*—Footpath from Kallampalayam to Sirur (part). *West*—Part of the western boundary of Coonoor Range.
1953–54 .. 1956–57. 1959–60. 1962–63. 1965–66.	Coonoor II ..	4,438	745	*Bit I—North*—Northern boundary of Rangaswamy peak reserve. *East*—The western boundary of bit I of coupe I and part of the district boundary. *South*—Part of the district boundary. *West*—Part of the streamlet from △ 5220, east of Danhatti in Rangaswamy peak and the western boundary of the Rangaswamy peak reserve. *Bit II*—Konekarai slopes, Cliff and Thattapallam reserves.
1954–55 .. 1957–58. 1960–61. 1963–64. 1966–67.	Coonoor III ..	4,125	1,109	*Bit I*—Burliyar reserve, part of Lamb's rock reserve lying south of the railway line and part of Hullikaldurg reserve adjoining the Coonoor river and south of it. *Bit II*—Benhope reserves I and II. *Bit III*—Kolakombai reserved forest. *Bit IV*—Melur slopes and Hiriyashige reserves and the unreserve of Hiriyashige.
		14,166	2,598	

Year.	Name and number of coupe.	Total area in acres.	Effective area in acres.	Boundaries.
		SIGUR RANGE.		
		Sigur Felling Series.		
1953–54 .. 1956–57. 1959–60. 1962–63. 1965–66.	.. Sigur I	27,414	6,087	*North*—Part of the Moyar. *East*—Sigur river. *South*—Part of the southern boundary of the felling series. *West*—Western boundary of the felling series.
1954–55 .. 1957–58. 1960–61. 1963–64. 1966–67.	.. Sigur II	22,070	3,124	*North*—Part of Kedarhalla. *East*—Part of the eastern boundary of the felling series. *South*—Part of the southern boundary of the felling series. *West*—Part of Kedarhalla.
1955–56 .. 1958–59. 1961–62. 1964–65. 1967–68.	.. Sigur III ..	25,174	2,011	*North*—Part of the Moyar. *East*—Part of the eastern boundary of the felling series and Kedarhalla. *South*—Part of the southern boundary of the felling series. *West*—Sigur river.
		74,658	11,263	

Section 6—Subsidiary Silvicultural Regulations.

612. *Tending.*—The growing stock in each of the coupes will be tended at the time of marking. The tending will include climber cutting and the cutting of branches of other growth interfering with sandal trees of and above 4 feet. In the tending operation care should be taken not to completely cut and remove any shrub or tree, which may serve as hosts, but only lopping of branches of the other trees to free the heads of the sandal plants of and over 4 feet in height will be done, in order to relieve the sandal from suppression. Species like *Acacia suma* and *Cassia montana* which are known to render the sandal susceptible to spike may be cut down during the tending operations, if they are found within a radius of 3 yards of a sandal tree.

Section 7—Other Regulations.

613. *Spike.*—The District Forest Officer will make a special note of the incidence and spread of spike in each of felling series when writing the Control Journal. Research in spike from the genetic point of view and for the isolation of spike-resistant strains for colonal propagation may also be undertaken in consultation with the Silviculturist

614. *Control.*—The control forms for this working circle, which accompany this plan, should be posted soon after the close of each financial year.

CHAPTER VIII.

WORKING PLAN FOR THE BAMBOO WORKING CIRCLE.

Section 1—General Constitution of the Working Circle.

615. The Bamboo Working Circle includes all areas in Coonoor Range, where bamboos occur in workable quantities. The area dealt with in this working circle lie on the lower eastern slopes of the Nilgiris and adjoin the bamboo coupes of Coimbatore North Division.

616. This working circle covers an area of 5,422 acres, the effective area under bamboos being about 1,516 acres. The working circle is divided into two series, namely, the Hulikal Series and the Vagappanai Series.

617. The following statement gives particulars of the two bamboo felling series constituted under this working circle :—

Number.	Name of the felling series.	Name of the reserves included.	Boundaries.	Area in acres. Total.	Effective.	Number of clumps.
1	Hulikal ..	Hulikaldurg and Burliyar.	*North*—Northern boundary of Burliyar reserve. *East*—Eastern boundary of Burliyar reserve and eastern bouudary of Hulikal reserve. *South*—Part of the southern boundary of Hulikal reserve. *West*—Part of the southern boundary of Hulikal reserve and a ridge to △ 6294, a streamlet from △ 6294 to the western boundary of Kavalkombe Estate, its boundary of Kavalkombe Estate its boundary, a line west to a streamlet, the streamlet to the Coonoor river, part of the Coonoor river and the western boundary of Burliyar reserve.	2,303	630	17,440
2	Vagappanai.	Vagappanai and part of Konakarai slopes.	Whole of Vagappanai reserve and a triangular bit in Konakarai slopes reserve in its south-east corner adjoining Haduthoraiballa and Vagappanai reserve.	3,119	886	101,752

Section 2—Analysis of the Crop.

618. Both *Bambusa arundinacea* and *Dendrocalamus strictus* occur mixed to varying degrees all over the tract included in this working circle, but the principal species of bamboo in Vagappanai and Hulikaldurg reserves is *Dendrocalamus strictus* and in Burliyar reserve *Bambusa arundinacea*.

619. The bamboo areas in this working circle have been both stockmapped and enumerated by a 10 per cent stratified systematic sampling. The total number of clumps calculated from the results of enumeration has been shown in paragraph 617 for each felling series and in paragraph 628 for each coupe.

620. The bamboo areas have been shown in two densities in the stock maps accompanying this plan. 'Dense' areas are those where the number of bamboo clumps exceeds 50 per acre, while sparse areas are those where the number of clumps is less than 50 per acre. The acreage of effective bamboo area in the different series and coupes is given below :—

Number.	Name of the felling series.	Name and number of the coupe.	Area in acres. Total area of the coupe.	Effective bamboo area.
1	Hulikal	Hulikal I	768	225
2	Hulikal	Hulikal II	371	155
3	Hulikal	Hulikal III	1,164	250
			2,303	630
4	Vagappanai	Vagappanai I	1,201	282
5	Vagappanai	Vagappanai II	827	334
6	Vagappanai	Vagappanai III	1,091	270
			3,119	886

621. A complete enumeration of the bamboos, both clumps and culms was made in a dozen one acre plots selected at random in the different bamboo coupes and the results have been given in paragraph 309. It was found that on an average a bamboo clump of this region contains about 13 culms.

Section 3—Method of Treatment.

622. *System of management.*—The system adopted for working the bamboos in this working circle may be defined as selection felling of the culms in the bamboo clumps.

623. *Felling cycle.*—The felling cycle will be three years as it had been found suitable for the locality both from the silvicultural and management points of view. Accordingly, each series contains three bamboo coupes, one coupe in each series being taken for exploitation annually in rotation.

624. *Regulation of yield.*—The coupes in the felling series have been constituted based to some extent on the effective area under bamboos in each coupe but to a greater extent depending on the topographical features of the country over which the bamboos lie scattered. The yield will be regulated on an area basis.

625. *Agency of felling.*—The fellings will be made through the agency of contractors, by selling the coupes prescribed for the year in open auction. The lease period will be one year for each coupe and will be concurrent with the fiscal year. Each annual coupe will form a separate lease unit. The sale of the bamboo coupes included in this working circle will be conducted annually by the Division Forest Officer, Coimbatore North Division, during the sale of the bamboo coupes of Mettupalayam Range of that division, according to the existing practice, which had been found to be administratively convenient. The revenue realized for the coupes will be credited to the revenues of the Nilgiris Division. The supervision of the work in the bamboo coupes of this working circle will be done by the concerned forest officials of the Nilgiris Division.

Section 4—Method of Executing Fellings.

626. One coupe in each series will be taken up for exploitation every year, in the sequence shown in the tabular statement of fellings given in paragraph 628 of this plan. The limits of the coupes have been shown in the bamboo felling series maps accompanying this plan.

627. The following felling rules are prescribed :—

(i) No culms less than one year old should be felled.

(ii) In addition to the culms less than a year old, at least six culms over a year old should be left unfelled in each clump, preferably on its periphery.

(iii) The culms left unfelled in the clump should be evenly distributed in the clump, as far as practicable.

(iv) No dead culms should be retained in the clump.

(v) None of the cut bamboos should be left unextracted in the clump.

(vi) All cuttings of bamboos should be below 3 feet from the ground level and above one foot from the ground level.

Section 5—Tabular Statement of the Fellings.

628. The details regarding the different bamboo coupes included in this working circle and their years of exploitation are shown in the following statement:—

Year of working.	*Name and number of the coupe.*	*Area of the coupe in acres.*	*Acreage of effective bamboo area.*	*Number of clumps.*	*Boundaries.*
		Hulikal Series.			
1953–54 .. 1956–57. 1959–60. 1962–63. 1965–66. 1968–69.	.. Hulikal I ..	768	225	5,614	*North*—Nil. *East*—Ponnaraikombai stream rising from △ 6294. *South*—Southern boundary of Hulikal reserve. *West*—Southern boundary of Hulikal reserve and felling series boundary to the starting point △ 6294.
1954–55 .. 1957–58. 1960–61. 1963–64. 1966–67.	.. Hulikal II ..	371	155	5,425	*North*—Part of the western boundary of the felling series, part of the western and southern boundaries of Kavalkombe estate and part of the stream running through Kavalkombe estate. *East*—Part of the eastern boundary of Hulikal reserve. *South*—Part of the eastern boundary of Hulikal reserve. *West*—Ponnarkombai stream to △ 6294.

Year of working.	Name and number of the coupe.	Area of the coupe in acres.	Acreage of effective bamboo area.	Number of clumps.	Boundaries.
		Hulikal Series—cont.			
1955–56 .. 1958–59. 1961–62. 1964–65. 1967–68.	.. Hulikal III ..	1,164	250	6,401	*North*—Northern boundary of Burliyar reserve. *East*—Eastern boundary of Burliyar reserve and part of the eastern boundary of Hulikal Reserve. *South*—Part of the stream running through Kavalakombe estate, western and southern boundaries of Kavalakombe estate and part of the western boundary of the felling series. *West*—Part of the western boundary of the felling series up to the Coonoor river, part of the Coonoor river and the western boundary of Burliyar reserve.
		Vegappanai Series.			
1953–54 .. 1956–57. 1959–60. 1962–63. 1965–66. 1968–69.	.. Vagappanai I ..	1,201	282	19,375	*North*—Part of the northern boundary of Vagappanai reserve. *East*—A streamlet from the northern boundary of Vagappanai reserve, the western and southern boundaries of Gadagur enclosure and the stream from Gadagur to the eastern boundary of Vagappanai reserve. *South*—Part of the eastern boundary of Vagappanai reserve. *West*—A path from Halur to Vagappanai reserve and a line north-north west to the northern boundary of Vagappanai reserve.
1954–55 .. 1957–58. 1960–61. 1963–64. 1966–67.	.. Vagappanai II ..	827	334	33,156	*North*—Part of the northern boundary of Vagappanai reserve. *East*—Part of the eastern boundary of Vagappanai reserve. *South.*—Part of the eastern boundary of Vagappanai reserve. *West*—The stream from Gadagur, eastern and northern boundaries of Gadagur enclosure and along a streamlet to the northern boundary of Vagappanai reserve.
1955–56 .. 1958–59. 1961–62. 1964–65. 1967–68.	.. Vagappanai III.	1,091	270	49,221	*North*—Part of the northern boundary of Vagappanai reserve. *East*—A line from the northern boundary of Vagappanai reserve, south-east to Vagappanai northern, western and southern boundaries of Vagappanai enclosure and the path from Vagappan i to Halur. *South*—Southern boundary of Vagappanai reserve and Hallurhalla. *West*—Western boundary of Vagappanai reserve. (Vagappanai Coupe III also includes a triangular bit in Konakarai slopes reserve in its south-east corner adjoining Haduthoraihalla and Vagappanai reserve.)

Section 6—Other Regulations.

629. *Control.*—The control forms which accompany this plan should be posted soon after the close of each financial year.

630. *Flowering of the bamboos.*—When sporadic or general flowering of any of the bamboos is noticed special mention should be made in the Control Journal.

CHAPTER IX.

WORKING PLAN FOR THE GRAZING WORKING CIRCLE.

Section 1—General Constitution of the Working Circle.

631. The Grazing Working Circle extends over the whole of this division, with the exception of certain specified areas which will be closed to grazing mainly for silvicultural reasons, and occasionally for other reasons.

632. The area closed to grazing will fall under three categories, namely :—

(i) Areas permanently closed to all grazing ;

(ii) Areas closed for specified periods under the provisions of this plan ;

(iii) Areas temporarily closed to grazing under the provisions contained in the Forest Manual, as a punitive measure in cases of unauthorized and wanton burning by the people of the locality.

633. The Golf Course in Wenlock Downs reserve, including the whole portion between the old and the new Pykara roads will always remain closed to grazing. The Game Sanctuary in Mudumalai Range will be closed to grazing to all cattle, except those of the residents of the Forest Colony at Kargudy and to the right-holders among the residents in the enclosures of Mudumalai reserve.

634. Closure to grazing will be applied for silvicultural reasons as follows :—

(i) All blue gum plantations will be closed for a period of five years from the year of planting or the year of coppicing as the case may be ;

(ii) all wattle plantations will remain closed to grazing throughout the rotation ;

(iii) all areas included in the Pyrethrum Working Circle will be completely closed to grazing ;

(iv) the compartments where selection felling had been carried out in the Selection Working Circle will remain closed for a period of five years from the year of felling ;

(v) all teak plantations will be closed to grazing for a period of six years from the year of formation ;

(vi) fuel coupes worked in Sigur Range for the supply of firewood will be closed for a period of five years from the year of felling ;

(vii) areas in the neighbourhood of elephant capturing area will be closed to grazing for such period as the pits remain covered ; and

(viii) all areas where experiments or research are conducted will be completely closed to grazing.

635. The District Forest Officer may close any area for a specified purpose temporarily. In cases where there is reason to believe that unauthorized burning had been done by the people of the locality, the area will be immediately closed for a specified period in accordance with the provisions contained in the Forest Manual.

636. A notification regarding grazing will be published every year in the month of May, specifying the areas closed to grazing and the conditions regulating the grazing in the different parts of the division.

Section 2—Method of treatment.

637. Grazing will be regulated by the issue of permits printed in accordance with the provisions contained in the Forest Manual. All animals, except goats, may be licenced to graze in the forest area. The admission of the goats into the reserve is forbidden, except in the case of those in transit to the plateau for slaughter.

638. A grazing permit will be valid throughout the division for one year commencing from the 1st of July. Grazing permits issued for slaughter cattle from Mysore side driven through the forests of this division will be valid only for three days, and are intended mainly for grazing in the forests during the halts in transit.

The grazing fees now in force are as follows :—

	Local.	Foreign.
	RS. A. P.	RS. A. P.
Buffaloes	0 3 0 per head.	0 8 0 per head.
Cows, bulls, donkeys and horses.. ..	0 1 6 ,,	0 4 0 ,,
Sheep	0 0 9 ,,	0 2 0 ,,

Slaughter cattle from Mysore side—

Cows and bulls, Re. 0–1–6 per 50 heads per day.

Sheep and goats, Re. 0–0–9 ,,

639. Cattle coming to the plateau from Coimbatore side through Coonoor Range will be treated as foreign cattle for grazing levy.

640. *Penning.*—Licences for penning cattle in approved pens will be issued on payment of separate fees, apart from the grazing fee paid for grazing the animals. The fees for penning licence will be Re. 1–8–0 for the first 100 cattle, Rs. 3 for cattle in excess of 100 but less than 200, Rs. 4–8–0 for cattle in excess of 200 but less than 300, and so on.

641. *Free grazing concessions.*—The Todas will be given free grazing permits for their own cattle. They can graze their cattle anywhere in the division, except in the areas specifically closed to grazing. The Todas of Kandalmund may graze their cattle in Aramby Swamp. The Todas of Kodappamund may graze their cattle on the grass lands of Snowdon Hill. Todas will be allowed to graze Badaga cattle in areas open to grazing along with their cattle, provided they carry with them permits for Badaga cattle in addition to those of their own cattle.

642. None other than the Toda can graze on the Toda patta-lands except with the permission of the Collector of the Nilgiris. In Toda patta-lands the Toda can also graze his goats.

643. Free grazing permits for 100 buffaloes belonging to Bergani temple, Nedugula village may be issued annually.

644. Residents in the enclosures in the forests of Mudumalai range will be allowed free grazing of their own cattle.

645. Cattle being driven up to the plateau from Mysore side for slaughter purposes as well as draught cattle travelling in the forests of the division will be allowed to graze free for a distance of 50 yards on either side of the road. These cattle in transit will be permitted to graze in the forests of this division, beyond the 50 yards referred to only on the purchase of the special permits intended for the cattle from Mysore side referred to in paragraph 638.

646. Mysore cattle other than those in transit to the plateau may also be permitted to graze in the forests of this division on payment of fees pertaining to foreign cattle. But permission may be refused for issue of permits in any year, if in the preceding season there had been an outbreak of rinderpest.

647. Cutting and removal of grass in headloads will be permitted in all forest areas except those closed for silvicultural reasons or for abuse of concessions. No removals, therefore, will be allowed from coupes under felling and the areas closed to grazing according to paragraph 634. The removal of grass from the forest areas will be subject to the following conditions :—

(i) The removal of grass will be allowed free only in headloads and for bona fide domestic use and not for sale. Removals in cart-loads will be permitted only on payment of the prescribed fee.

(ii) No removal of grass shall be made in the areas closed to grazing.

(iii) Removals may be made throughout the year, but they shall not be made before dawn or after dusk.

(iv) No permits will be required for grass removed in headloads free of charge.

(v) No grass should be uprooted. It shall be cut with sickles. Grass collectors shall not carry bill-hooks or felling axes into the forest area. Only sickles will be allowed.

(vi) Removals should be made only through the recognized footpaths or roads ;

(vii) No forest produce shall be cut to stiffen or tie the grass bundles.

(viii) The headloads and cartloads of grass should be presented for inspection when demanded for inspection by any one of the forest staff. The free removal of grass in any particular locality is liable to be terminated for serious breach of any of the conditions governing the removal of grass or the provisions of the Forest Act.

648. *Rotational burning in the Kundahs.*—The annual migration of the cattle of Todas and Badagas to the Kundahs and the annual burning of the grass-lands in that region are the essential features of the grazing economy in the Nilgiri plateau. The scheme of rotational burning suggested in this plan takes into account these customs of the local graziers, with due safeguards for the protection of the scattered shola patches against fires. As the burning of the grass-lands in the region used by Toda and Badaga cattle has to be permitted, it becomes necessary that the burning should be regulated so that the risk of fire to the shola patches is reduced to the minimum. It is, therefore, clear that (i) unauthorized burning by the graziers or the local people should not be allowed ; (ii) all burning operations must be licensed and departmentally supervised ; and (iii) burning should be done early so as to reduce the risk of accidental fires.

649. The scheme of controlled rotational burning will mainly include the following reserves :—

(i) Kundah.

(ii) Kokkothorai.

(iii) Wenlock Downs.

(iv) Kadacoppa.

(v) Porthimund.

(vi) Pichalbettu.

650. The entire area included for rotational burning will be open to grazing except such parts of it that may be closed to grazing for silvicultural or other reasons. The area included for rotational burning will be divided into grazing blocks. In order to provide for the migratory cattle for the Toda cattle 11 blocks have been constituted around 11 Todamunds and for the Badaga cattle 19 blocks around 19 hundis. To each pen (mund or hundi) a block of grass-land which includes some shola patches also, had been allotted around it or near it. In addition to the migratory cattle, provision has also been made for village or estate cattle resorting to the Kundahs, for day-to-day grazing, so that those cattle may also come under the purview of the scheme of controlled burning and thus avoid any risk of accidental fires from the graziers coming from the village or estate.

651. The following statements give details of the munds, hundis, estates or villages dealt with, the area of the grazing blocks and the reserves in which they are included :—

Number and name of the mund.	*Name of the reserve in which the grazing block is allotted.*	*Area of the grazing block in acres.*	*Name of the munds from which migration takes place.*
1 Bettamund	Kundahs	1,020	Kulkuramund and Nathnarimund.
2 Kaitarikemund	Wenlock Downs	640	Agaradumund.
3 Kolimund	Kundahs	950	Bettamund.
4 Kudugadumund	Do.	500	Nedugodumund.
5 Krurmund	Porthimund and Wenlock Downs.	500	Pennapulamund.
6 Narigulimund			Schoolmund.
7 Narigulimund	Kundahs	480	Mullimund.
8 Omemund	Do.	..	Heragirmund. (This block is common with the one provided for Kokkotheraihundi).
9 Heragamund	Kundahs	320	....
10 Thamagmund	Porthimund	450	Sholur.
11 Porthimund	Porthimund and Pichalbettu.	400	Agaradumund.
		5,263	

Badaga hundis and the grasing blocks allotted to them.

Number and name of the hundi.	*Name of the reserve in which the grazing block is situated.*	*Area of the grazing block in acres.*	*Villages resorting to the hundis.*
1 Nanjamutty	Kundahs	1,560	....
2 Kannier	Do.	1,450	Nanjanad.
3 Doddamara	Do.	1,980	Attubail. This includes also 'Mana.'
4 Kokkotherai	Kundahs and Kokkotherai	990	Kachigatty. This block is common with the one provided for Ornemund.
5 Hadnantolenare	Kundahs	1,000	Mullimalai.
6 Bajjakorai	Do.	640	Kachigatty.
7 Thalakavara	Do.	1,570	Yadakad, Bikkatti and Mulligur.
8 Havalada	Do.	1,070	Balakola.
9 Doddothordi	Do.	1,340	....
10 Doddabetta	Do.	1,400	....
11 Kudikadu	Do.	1,450	....
12 Cardonai	Do.	1,200	....
13 Tirubunthorai	Do.	1,100	....
14 Kethar	Porthimund and Pichalbettu.	1,490	Nanjanad.
15 Urakoraipatty	Wenlock Downs	740	Karuthukuli.
16 Kullundi	Do.	900	....
17 Ettakal	Do.	740	Hallatti.
18 Uthalhundi	Do.	820	Nanjangad. This block includes the old hundi Kadambukorai.
19 Kattihundi	Porthimund and Pichalbetta.	920	Athikullu.
		22,360	

Details of grazing blocks allotted for day-to-day grazing by village and estate cattle :—

Number and name of the hamlet or estate.	Reserve in which the grazing block is situated.	Area of the block in acres.
1 Thiashola estate	Kundahs	420
2 Melkundah village	Do.	270
3 Mullimalai, Kanchigatty, Keraipadu and Kunda Kotagiri.	Do.	640
4 Bikkatti, Osatti, Mulligur and Yedakad	Do.	730
5 Emerald Valley Estate	Redhill	200
6 Red Hill Estate	Kadacoopa	540
		2,800

652. No limitation is placed on the number of cattle allotted to each pen in view of the limited number of cattle that resort to grazing in these areas. Limitation to a fixed number will mean a loss of grazing revenue and the unlicensed cattle which in any case would stealthily resort to these pastures are not susceptible of easy check. Permits may be issued to the extent there is demand. If there is room for complaint that any particular area allotted to a mund or hundi is congested due to a large concentration of grazing animals, either the area of the grazing block may be increased or new blocks opened for a particular set of cattle at the discretion of the District Forest Officer. In the issue of permits to any grazing block the first preference would be for those villages that usually resort to them as indicated in the statements given above.

653. The lay out of the grazing blocks is shown on the Kundah Grazing Map (Scale 1 inch to a mile) accompanying this plan.

654. The District Forest Officer may make any addition to the list of pens given in the preceding statements, if there is demand for the same and if there is no objection from silvicultural or other considerations in complying to the request of the graziers for additional pens.

655. The graziers will be permitted to use free of charge specified materials available from the forests for putting up fence round the cattle pens, and sheds for themselves and for sick and young animals. But they must get the specific permission of the concerned Range Officer before they utilize the produce, so that it may be possible to check that only specified kind of materials are used.

656. *Burning of the grass-lands.*—The controlled burning of the grazing blocks included in the Kundah Grazing Scheme will be done on a cycle of two years. Each grazing block is accordingly divided into two nearly equal compartments, natural features being adopted as far as practicable as the boundaries. Each compartment will be burnt in alternate years. Burning will be done under departmental supervision by the graziers who are allotted the concerned grazing blocks. Applications for penning licences should be disposed

of in the months of November and December by the concerned Range Officers. Before penning licences are issued a declaration to the effect that they will undertake to burn the compartment due for burning, if required by them, only under departmental supervision and conditions should be received and filed in the Range Office. No area need be burnt even if it is due for burning, unless the graziers require it and are willing to burn the specified area. No area other than that indicated for burning in a particular year should be burnt by the graziers. A strip of ten yards wide will be left unburnt around each shola and burning will be started from a line ten yards away from the periphery and will be directed away from the shola.

657. All burning should be completed before the middle of February. Burning should be commenced early in January as soon as the grass is dry enough to burn satisfactorily.

658. *Closure of unauthorized burnt areas.*—All areas where there is reason to believe that there had been unauthorized burning, the District Forest Officer will close the areas to grazing for a specified period in accordance with the provisions contained in the Forest Manual. Such closure should follow swiftly after the fire, so that it may have the maximum effect.

Section 3—Other Regulations.

659. For Todamunds situated in Todapatta land, no penning licence would be necessary, for occupation by Toda cattle.

660. *Demarcation of the closed areas.*—All areas closed to grazing will be marked off on the ground by means of red sign-boards at as many points as may be necessary.

661. *Control.*—The control forms accompanying this plan should be posted at the close of each financial year.

CHAPTER X.

WORKING PLAN FOR THE MINOR FOREST PRODUCE WORKING CIRCLE.

Section 1—General Constitution of the Working circle.

662. The Minor Forest Produce Working Circle will cover all the reserved forests and the unreserves of the Nilgiris district. The exploitation of the minor forest produce of the reserves and the unreserves would be done jointly through a single agency for each unit of exploitation, so that there may not be any leakage of the produce or revenue, which is inevitable if there are different agencies collecting similar produce in the same region. Each taluk of the district will be a unit for the exploitation of the minor forest produce, of both the reserves and the unreserves lying in the taluk. The entire work in this connection both in the reserves and the unreserves will be under the management of the District Forest Officer.

Section 2—Analysis of the crop.

663. The principal items of minor forest produce in the Nilgiris are honey, wax, tamarind deer and sambhur horns, shekoy (*Acacia concinna*), gallnuts (*Terminalia chebula*), avaram bark (*Cassia auriculata*), konnai bark (*Cassia fistula*), stone and tree moss, winter-green (*Gaultheria fragrantissima*), soapnuts (*Sapindus emarginatus*), pungam seeds (*Pongamia glabra*), marking nuts, neem seeds, date leaves and korai grass. There are a great variety of medicinal herbs and shrubs in the Nilgiris, but they are not collected on a large scale, due to limited demand in the market and lack of proper organization on the part of the minor forest contractors in the collection of any produce other than those with which they are very familiar. There is reason to believe that the yield from minor forest produce is capable of considerable expansion. Rare produce like slamisri (*Orchis maculata*) common in Bison Swamp and other localities in the Kundahs are attracting the attention of those collecting minor forest produce.

Section 3—Method of Exploitation.

664. Deer and sambhur horns and the valuable remains of dead animals will be collected departmentally in the interests of preservation of wild life, because, contractors may not necessarily confine their collection to those horns found fallen on the forest floor.

665. All minor forest produce other than deer and sambhur horns and valuable remains of dead animals, will be exploited through the agency of contractors. The right to collect the produce will be leased out annually by sale in open auction during the month of May every year.

666. There will be three lease units, each with a lease period of one year commencing from 1st July. There will be a separate lease for each taluk of the district as detailed below :—

(i) Lease to collect the minor forest produce in the reserves and unreserves of Ootacamund taluk ;

(ii) lease to collect the minor forest produce in the reserves and unreserves of Coonoor taluk ; and

(iii) lease to collect the minor forest produce in the reserves and unreserves of Gudalur taluk.

667. The agreement entered into for collection of the minor forest produce will contain the list of produce that could be collected under each lease.

668. Bamboos in Sigur and Mudumalai Ranges do not hold out any promise of organized exploitation under a separate lease. The lease units for Ootacamund and Gudalur taluks (vide paragraph 666) will include bamboos as one of the items of minor forest produce that can be collected by the minor forest produce contractor. The cutting of the bamboos will be regulated by the felling rules given in paragraph 627. As the working of the bamboos in Coonoor Range is covered by the working plan for the Bamboo Working Circle (Chapter VIII of part II of this plan), bamboos will not be included in the minor forest produce lease unit for Coonoor taluk (Vide paragraph 666).

669. *Cassia fistula* bark collection will have to be done on a rotation of five years as this period had been found to lead to the production of maximum tanning material in the bark. Therefore the lease units for the years 1955–56, 1960–61 and 1965–66 alone will include *Cassia fistula* as one of the items of the lease.

Section 4—Other regulations.

670. *Control.*—The Control forms for this working circle, which accompany this plan should be posted every year soon after the termination of the lease period of each minor forest produce lease unit.

CHAPTER XI.

Miscellaneous Regulations.

Section 1—Hardwood Eucalyptus Plantations.

671. As the hardwood Eucalyptus species raised in the past were not found to yield good timber in this locality, most of the areas that are occupied by such species are included for conversion into blue gum plantations (Vide paragraph 317). However, for historical and arboretal interest as well as for research purposes, it is proposed to retain a small compact area of 24·10 acres in Aramby Block so as to include some of the hardwood Eucalyptus species raised in this division.

672. The details regarding the hardwood Eucalyptus species areas to be retained for the time being are given below :—

Number and year of plantation.	Name of the block and compartment.	Species.	Acreage.
1 1912	Aramby VI 1	*E. eugenioides*	4·30
2 1912	Aramby VI 2	*E. pillularis*	4·40
3 1911	Aramby VI 4	*E. propinqua*	4·60
4 1911	Aramby VI 5	*E. acmenoides*	4·10
5 1911	Aramby VI 6	*E. paniculata*	3·10
6 1911	Aramby VI 9	*E. punctata*	3·10
		Total	24·10

673. The plots referred to above also include the Silviculturist's sample plots and hence the rate of growth of the various species can be studied further comparing with the data already available with the Silviculturist.

674. The hardwood Eucalyptus plantations to be retained in Aramby Block VI will have to be treated as high forest, and hence for their satisfactory development systematical thinnings are necessary. These plantations had not been thinned systematically in the past. They are already approaching the stage of final thinnings. The plantations (excluding the Silviculturist's plots) will be thinned twice during the period of this plan. The thinnings will be carried out in all the six compartments in the years 1954–55 and

1963–64, the former thinning being the penultimate thinning and the latter the final thinning for the crop. The intensity of thinning required will depend entirely by the condition of the crop. The District Forest Officer will mark the trees to be removed in the thinnings. All suppressed, defective and moribund trees will be removed and the dominant spaced out as far as possible uniformly.

675. A small plot one square chain in size in Cairnhill Block III, compartment 2 will be maintained for arboretal interest, as it contains Eucalyptus maculata trees not found in Aramby Block VI. This plot will be examined in 1959–60 and if any thinning is necessary, it will be carried out after marking is done by the District Forest Officer.

Section 2—Fire protection.

676. Fires are a recurring problem in this division ; they are serious especially in Mudumalai and Sigur Ranges. Accident is the main cause of fire in Mudumalai Range where it arises internally through the carelessness of the jungle folk or spreads from Mysore across the border. In Sigur Range most of the fires are started by the grazing interests. In the plateau ranges, fires are common in the grassy stretches and are mainly due to wilful burning by graziers or occasionally caused by shikaris.

677. Fire protective measures prescribed in this plan are : (i) Indirect or deterrent measures involving no expense and aiming at the removal of the temptation or opportunity for wilful burning of the forest ; (ii) Fire-fighting measures for the extinction or localization of fires immediately after they have broken out and (iii) Direct or mechanical measures for the removal of inflammable material in definite parts of the forest.

678. The direct measures like the fire tracing of certain lines and maintenance of a net-work of internal and exterior lines have their limitations and they are not proof against wilful firing or against ravaging fires spreading with terrific speed and intensity. A forest will always remain inflammable even under the most elaborate system of fire lines, but such measures are however necessary to a certain extent as they serve a valuable purpose in limiting the extent of fire damage by localizing the fire to definite parts of the forest.

679. The indirect measures to combat wilful fire lies in the prompt and effective closure for a specified period of all areas where unauthorized or wilful burning had taken place. A deterrent measure of this nature is necessary to remove the temptation for unauthorized or wilful burning of the forests by the grazing or other interests. In the grass-land areas like the Kundahs and the Downs, where the periodic burning of the pastures forms a part of the grazing economy of the local graziers, the unauthorized burning will be reduced to the minimum by the controlled rotational burning under the supervision of the forest subordinates (vide paragraphs 656 and 657). Such authorized burning allowed in the Toda and Badaga grass-lands help to save the scattered sholas and plantations from the ravages of wilful or unauthorized fires.

680. *Measures to be adopted on the outbreak of fires.*—Immediately the outbreak of fire in the forest is noticed, the local subordinates will, no matter what time of day it is, collect a sufficient number of men, go to the spot and extinguish the fire, either by throwing earth on it, or by beating it out with branches or by counter-firing. It is most important that an attempt should be made to put out every fire that had been noticed or brought to notice irrespective of whether the fire is apparently harmless or uncontrollable. Fire occurrence reports will be submitted to the District Forest Officer in accordance with the Standing Orders. Investigations to trace the cause of fire, and if it is due to wilful burning, to detect the offender must be made in every case.

681. The block lines and compartment lines for which no special provision is made should be kept in good condition by cutting back all growth, whenever they are noticed by the protection staff during the course of their perambulations.

682. *Protection of plantations (in all ranges).*—All plantations in all ranges will have scarped lines 9 feet wide surrounding them. It is essential that all grass and leaves found on the lines should be heaped by collecting them to the middle of the line and burning them annually. The work of fire tracing the periphery of all plantations should be commenced in the middle of December and the work completed before the end of January, every year.

683. The other measures adopted for the fire protection are dealt with in the following paragraphs in respect of each range.

684. *Mudumalai Range.*—The forests of the range will as a whole be protected by a system of fire lines and of fire traced roads and paths. The details regarding the net work of lines, roads and paths are given below :—

	Approximate length in miles.
(i) Exterior lines—	
1 Nilgiri-Malabar boundary line from Kaikatti on Sultan's Battery Road to Maragaddi.	10
2 Nilgiri-Mysore frontier from Maragaddi to junction of Kekkanhatta with Moyar this is a cleared line for a distance of $3\frac{1}{2}$ miles from Kharabhavi-kanave (Station E) to point near △ 3,262 and elsewhere streams form the frontier.	20
3 South-western boundary of Mudumalai Block-Moyar to Aduppukuttisal ..	10
4 Southern boundary of Benne reserve from Aduppukuttisal to Kaikatti on Sultan's Battery Road.	8
5 Outer boundary of compartments 12, 13 and 14 (from the north-east corner of compartment 12 to south-west corner of compartment 14).	$9\frac{1}{2}$
Total ..	$57\frac{1}{2}$

(ii) Internal lines—	
1 Teppakadu-Mudumalai Block line	7
2 Mudumalai Benne Block line (eastern boundary of Benne reserve ; Aduppu-kuttisal to Naratibetta).	$4\frac{1}{2}$
3 Mudumalai-Doddakatti Block line (Honnushatti-Jaldari Road)	9
Total ..	$20\frac{1}{2}$

(iii) Roads and paths—	
1 Mysore-Gudalur road from Kekkanhalla to Thorapalli	10
2 Kargudy-Mudumalai (Morgan's road)	5
3 Mudumalai-Thorapalli road	6
4 Mudumalai-Kekkanhalla road (from the point of junction with Kargudy-Mudumalai road).	4
5 Teppakadu-Mudumalai road (to point of junction with Mudumalai-Kekkan-hatta road).	$3\frac{1}{2}$
6 Mudumalai-Benne Wynaad boundary road	10
7 Church Estate road	2
8 Benne-Mukkatti road	$3\frac{1}{4}$
9 Teppakadu-Masinagudi road (within reserve limits)	$3\frac{1}{2}$
10 Mudumalai-Karboi path (via Dodakatti)	9
Total ..	$56\frac{1}{2}$

685. The exterior lines will be dealt with as follows—(*a*) *Nilgiri-Mysore frontier.*—This will be dealt with in two sections, namely, Maragaddi to Ambuhalla (15 miles) and Ambudhalla to Moyar (5 miles). In the former section a guide line 6 feet wide will be cut about one and a half furlongs from the frontier. Where the frontier is a cut line a second guide line of the same width will be cut along the outer edge of the boundary. Elsewhere the streams which form the boundary will be treated as guide lines. In the second section a guide line 6 feet wide will be cut parallel to the Kekkanhalla about hundred yards from it. The cutting of the guide lines will be completed before the end of December every year. Burning outwards towards the frontier from the inner guide line will be started early in January and completed in that month.

(*b*) *South-western boundary of Mudumalai block and southern boundary of Benne reserve.*—The lines together constitute the southern boundary of the range. This boundary will be cleared of all undergrowth to a width of 30 feet annually in November and December and the cut material put in the middle of the line and burnt in January.

(*c*) *Nilgiri-Malabar boundary and the outer boundary of compartments* 12, 13 *and* 14.—An outer guide line 6 feet wide will be cut along the outer edge of the boundary and an inner guide line of the same width will be cut parallel to it at a distance of about 100 feet from it. In the case of the outer boundary of compartments 12, 13 and 14, streams which form the boundary will be treated as outer guide lines. Where the boundary is an artificial one, the outer guide line should always be cut. The cutting of the guide lines will be completed before the end of December and the burning from the inner guide line outwards should be completed before the end of January.

686. The burning of the outer boundary of compartments 12, 13 and 14 will be done by the Sigur Range along with the fire tracing of Teppakadu-Masinagudi Road (within reserve limits).

687. Before burning is undertaken in the case of the exterior lines referred to in paragraph 685 due notice should be given to the District Forest Officers of Wynaad and Mysore and to the concerned Range Officers. The land owners adjoining the southern boundary of Mudumalai Range will also be duly informed.

688. *Block lines in Mudumalai Range.*—Guide lines 6 feet wide will be cleared on either side of the block lines in November and December. The growth of woody species in the block lines will be cut at the same time. Burning of the block line from the guide lines outwards will be completed before the end of January.

689. *Fire-tracing of roads and paths in Mudumalai Range.*—Guide lines three feet wide will be made by cutting or breaking grass on both sides of the road or path at a distance of about one chain from the road or path. Burning will be done from the guide line towards the road or path. The work will be started towards the end of December and must be completed before the end of January.

690. In the case of Mysore-Gudalur road (Kekkanhalla to Thorappalli) burning will be done only on the western side of the road in the case of the section from Bidhurhalla to Theppakadu. The Moyar runs close by along the eastern side of the road in this section and a narrow ribbon of forest with more mesophytic undergrowth is present between the road and the river. No burning is therefore necessary in this section on the eastern side of the road. In the section from Bidhurhalla to Thorapalli burning will be done on both sides of the road.

691. *Protection of forest depots in Mudumalai Range.*—Forest depots will be protected by fire lines.one chain wide. Guide lines six feet wide will be cut in December both on the inner and outer edges of the one chain wide fire line and the fire line burnt in January commencing the firing from the guide lines.

692. *Fire patrols in Mudumalai Range.*—Eighteen fire patrols to be recruited as far as possible from the local forest tribe of Jain, Kurubars will be appointed annually for a period of three months from the 1st January to the 31st March.

693. *Sigur Range.*—In addition to the burning of the outer boundary of compartments 12, 13, 14 of Theppakadu block and the fire tracing of Theppakadu-Masinagudi road within the reserve limits [vide paragraphs 685 (*c*) and 686] the following system of lines and paths or roads or tracks will be fire traced :—

	Length in miles.
(*a*) Lines—	
1 The Moyar line from the north-east corner of compartment 12 along the river to join the Avarahalla boundary near Chikkamangudi.	5
2 The eastern boundary of Kalmalai reserve	$2\frac{1}{4}$
3 The western boundary of Singara reserve from the limit of Coffee Estates down to the Avarahalla stream.	3
4 The northern boundary of Kalhatti Slopes reserve for a distance of about 4 miles along the northern boundary westwards from the point it meets the Sigur Ghat road near the 15th mile stone.	4
Total ..	$14\frac{1}{4}$

In the case of the Moyar line, a guide line six feet wide will be cut parallel to the river and at a distance of 100 yards from it in November-December and burning will be done from the guide line towards the river before the end of January. In the case of the other lines, which are reserve boundary lines, a guide line six feet wide will be cut at a distance of one chain from the boundary line in November December. The reserve lines which will always be kept cleared by the subordinates will be treated as the outer guide line, and the burning will be done before the end of January from the inner guide lines outwards towards the boundary line.

(b) *Paths, roads and cart-tracks*—

	Approximate length in miles.
1 Path from Chembanatham to Guruvegoundankudi and to Moyar river.	3
2 Path from Singara to Bokkapuram	3
3 Path from Bergani to Addaraipatti	$1\frac{3}{4}$
4 Path from Kambatti to Addaraipatti	$2\frac{3}{4}$
5 Path from Ebbanad to Sirur Temple	$2\frac{1}{2}$
6 Path from Ebbanad to Anaikatti	$3\frac{1}{4}$
7 Path from Chinnakunnur to Anaikatti	$3\frac{1}{2}$
8 Path from Succouth Estate to Sigur Road	$1\frac{1}{4}$
9 Path from Sholur to Bokkapuram temple	$2\frac{1}{2}$
10 Path from Masinagudi to Chembanatham	$2\frac{1}{4}$
11 Cart-track from Masinagudi to Bokkapuram	$1\frac{1}{4}$
12 Road from Masinagudi to Moyar H.E. Camp (within reserve limits).	$4\frac{1}{2}$
13 Road from Masinagudi to Mavinhalla (within reserve limits)	$2\frac{1}{4}$

A guide line three feet wide will be cut on either side of the paths listed above at a distance of about half chain from the middle of the path. In the case of cart-tracks and roads a guide line six feet wide will be cut about a chain away from either side of the road. The guide lines in all cases should be cut in November-December. The burning of the fire line from the guide lines towards the path or track or road should be completed before the end of January.

694. One fire patrol will be appointed recruited from the local jungle tribe of Kasabas for a period of three months from the 1st of January every year, in connexion with the fire protection work in Sigur Range.

695. *Ootacamund North Range.*—Five fire patrols one each for Aramby, Snowdon, Governorshola, Sholur and Honnathalai areas will be appointed for a period of three months from the 1st of January, each year.

696. *Ootacamund South Range.*—Eight fire patrols for the protection of Kundahs, one for the protection of Cairnhill and the adjoining areas, two for Mukurti wattle areas and one for Avalanche wattle areas will be appointed annually for a period of three months from the 1st of January.

697. *Coonoor Range.*—The eastern boundary of the division (common boundary between Coimbatore North Division and the Nilgiris Division) will be maintained by Coimbatore North Division according to the provisions contained in the working plan for that division.

698. The sandal areas in Rangaswami Peak will be protected by cutting in December two guide lines six feet wide one chain apart on the western and northern sides of the area. The grass and the weeds between the guide lines will be burnt in the middle of January from the top downwards. Guide lines six feet wide parallel to the southern and eastern boundaries will be cut in December about ten yards from the inner edge of the boundary lines and burning will be done in January outwards from the guide lines towards the boundary line.

699. The following paths in Coonoor Range will be fire traced annually by cutting in December a guide line three feet wide on either side of the path, at a distance of about ten feet from the middle of the path and burning the strip between the guide lines in the month of January :—

(1) Path from Madanad to Hallimoyar ($2\frac{1}{2}$ miles).

(2) Path from Hallimoyar to the common boundary of Sigur and Coonoor Ranges ($7\frac{3}{4}$ miles).

700. Two fire patrols, one for Melur section and one for Kotagiri sections will be employed in Coonoor Range every year for a period of three months commencing from the 1st of January.

701. *Fire-Maps.*—Fire-maps on a scale of 1″= one mile will be maintained separately for each Range. Every case of fire will be marked on the maps, serial numbers being given to the fires in the chronological order. The dates of fires will also be shown on the maps. All fire lines burnt will be indicated. One set of maps will be used for five successive years, the fires of each year being distinctively marked with different symbols or colours.

Section 3—Roads.

702. The roads, cart-tracks and bridle paths in the division are given in Appendix VIII. They will all be maintained in good repair.

703. During the annual repairs to the roads, wherever possible, the progressive improvement of the roads in width and surface should be aimed at so as to allow motor car or lorry traffic. One of the important functions of the roads and paths passing through the forest areas is to serve as fire breaks. Hence the surface of the roads should be kept clear of inflammable material during the fire season, by collecting the dried materials to the centre of the road and burning them.

704. The road from Benne to Mukkatti and from Mudumalai to Benne should be improved during the period of this plan to make it fit for motor traffic. The improvements and special constructions may be carried at the rate of one mile per year during the period of this plan. The routine maintenance repairs in respect of these roads will, however, be carried out throughout the length of the roads every year.

Section 4—Buildings.

705. The list of buildings in this division is given in Appendix IX. All of them will be maintained in a state of good repair. The surroundings of the offices, rest houses and residential quarters must be kept clear of undergrowth, not only as an anti-malarial measure, but also as a measure of fire protection. Pyrethrum extracts or other anti-malarial spraying should be periodically done, in the case of buildings in malarial tracts.

706. The colony in Kargudy and the rest house require improvement. Electrification of the colony and the rest house are essential to add to the amenities of the locality, as well as to attract visitors to the Game Sanctuary.

707. A scavenger to the colony is essential to improve the sanitary conditions of the colony as well as to meet the needs of the visitors to the Game Sanctuary who halt in the Kargudy Rest House. Wherever necessary suitable latrines have to be erected for the subordinate quarters. The Sanitary arrangements provided for in the Rest House may be extended to the Rangers' residence during the period of this plan. The possibility of extending such facilities to other residential quarters will be taken up later on.

708. The water supply to the Kargudy colony requires improvement. With the electrification of the colony the erection of suitable pumping sets should also be undertaken for easy transport of water from the Moyar to the colony and the Rest House.

709. The Ranger's residence and the subordinates line at Masinagudy will be electrified during the period of this plan. Facilities for obtaining water from the pipe line running from Singara to the Masinagudy Hydro-electric camp should also be arranged to relieve the scarcity of water in the residences.

710. Quarters for foresters will have to be built one each at Thorapalli and Teppakadu. The quarters to be erected at Thorapalli should be taken up immediately as the forester required for teak regeneration operations may be stationed there. He will incidentally serve the valuable purpose of checking any poaching into the Game Sanctuary from the Thorapalli side. The forester required for the Elephant camp will be stationed at Teppakadu and reside in the quarters to be built at Teppakadu.

711. Residential quarters for the forest guard and the reserve watcher, one each, will have to be erected for the Subordinates of Sirur, Anaikatti, Sigur, Bokkapuram and Singara beats of Sigur Range. One forest guard's quarters at Thorapalli and one at Kakkimhalla will be erected in Mudumalai Range. The erection of quarters may be so taken that one beat is provided for each year, so as to distribute the expenditure over the period of this plan.

712. There is no residential quarters for the District Forest Officer at Ootacamund. It is suggested that Government may purchase a suitable building available within the municipal limits of Ootacamund, as many buildings are available for sale at present, instead of building a new bungalow, as the cost of materials for the erection of a building suitable for use by the District Forest Officer is at present great.

713. In the Bishop Down Colony, quarters for the Ootacamund North Range Office clerks and for two more clerks of the District Forest Office may be constructed during the period of this plan.

Section 5—Planting of Ornamental trees in Lascelles.

714. For æsthetic reasons, ornamental trees will be planted on the edge of the Lascelles plantation (Brooklands compartment 11) which is near the Ootacamund Golf Club. Lascelles is a conspicuous land mark in the Wenlock Downs and hence while utilizing the area for blue gum growing, the periphery may be planted with suitable ornamental trees.

715. As prescribed in paragraphs 340 and 344 the outer row of blue gum trees in the plantation will not be felled while the area is coppiced. Outside that row of blue gum trees on the periphery a single row of ornamental trees will be planted along the edge of the plantation in the following pattern :—C F C D C J C F C D C J C. . . .
Where F refers to *Eucalyptus ficifolia* (Scarlet red flowers), D to *Acacia decucnens* (yellow flowers), J to Jackaranda (Purple flowers) and C to *Ceryptomeria japonica*. The *Cryptomeria japonica* seedlings will be planted 66 feet apart along the periphery and in between two such plants the other ornamental species will be planted. The ornamental trees on the periphery will therefore be 33 feet apart. The ornamental trees and the outer row of blue gum trees will not be felled, when the blue gum trees inside the area are felled.

Section 6—Plantations of conifers and other exotics.

716. Woods of various conifers and other exotics occur scattered in the various blocks of the plateau ranges. These species were mostly introduced by Gamble about the year 1886 in his experiments to discover a suitable exotic timber species for the Nilgiris. These areas occupy sites in the vicinity of centres of firewood consumption, and as they no longer serve any valuable purpose (the species are not found useful as timber in this locality) and in order to bring the land occupied by them for a better purpose they will all be converted into blue gum except the plots of the Silviculturist which will serve both the research purposes as well as historical and arboreal interests. Hence every year about 10 acres of such plantations lying within a radius of 10 miles from Ootacamund or Coonoor will be clear-felled and planted with blue gum at an espacement of 10 feet × 10 feet. The areas to be chosen for conversion are those occupied by the following species :—

Cryptomeria japonica, Calitris rhombridea, Acacia melonoxylon, Pinus longifolia, Cupressus spp., Casuarina quadrivalvis, Hakea spp., Grevellia robusta, Casuarina suberosa and *Acacia dealbata*.

717. Such converted blue gum plantations will be worked within the frame work of the working plan for the Blue Gum Working Circle and will be amalgamated into the Blue Gum Working Circle during the next revision of this plan.

718. The Mahogany plantation near Burliyar will be maintained and the mature trees in it will be worked under the shelter-wood system so as to gradually bring up the natural regeneration. The surrounds of the plantation will be cleared of all undergrowth to a width of a chain and the leaf litter worked into the soil in order to aid the spread of mahogany natural regeneration. The Silviculturist will be consulted whenever any silvicultural operations are undertaken in this area.

719. The plantation is located in the Burliyar reserve. The species of mahogany planted is *Sweitenia macrophylla*. It extends over an area of about 3 acres. It was planted about the year 1885 at an espacement of 12 feet × 12 feet. There is good regeneration of mahogany and it requires tending by way of thinnings and gradual opening of the canopy in due course.

720. A record of all works done in the Mahogany plantation and of any outturn obtained will be maintained in a journal form.

Section 7—Badaga Fuel Permit System.

721. The evils of the Badaga Fuel Permit System, under which a Badaga family is entitled on a payment of one rupee per annum, to remove unlimited quantities of dead wood from any shola had already been referred to in paragraph 240. This system was adopted at a time when the Badaga was less a prosperous community. The Badagas are now a prosperous community, thanks to the increase of potato, tea and coffee cultivation. Many of the Badaga families grudge to pay even the nominal fee and there are instances of their entering the reserves with or without permits and cut and remove both dead and green firewood, very often for sale than for *bona fide* domestic use. The earlier this pernicious system is abolished the better it is for the conservation of the sholas.

722. As a measure to restrict the sale of such fuel permits and with a view to gradually bring to an end this evil system, the permit fee had been enhanced to Rs. 12 per annum instead of the original nominal fee of one rupee per annum by G.O. Ms. No. 4884, Development, dated 14th November 1952. The position will be reviewed at the end of three years and before it is done, it is better to initiate steps which will aid in complete eradicating the system by offering alternate sources of fuel supplies to the Badagas.

723. The Badaga fuel permits should in the meanwhile be issued only to Badaga families in indigent circumstances so that it may be gradually reduced and completely stopped in the year 1960. The Badaga plantations in the following areas will be felled and replanted with blue gum at an espacement of 10 feet × 10 feet. They will be managed

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according to the prescriptions of the working plan for the Blue Gum Working Circle except that there will be condition in the sale of the growth of these plantations to the effect that the produce from the clear felled area should be supplied to the population residing within ten miles radius of the plantation. The details regarding the Badaga plantations to be clear-felled and replanted are indicated below :—

Number and name of plantation.	Acreage.	Year of clear felling.	Year of replanting.
	ACS.		
1 Iduhatti	4·50	1955–56 ..	1956
2 Chinnakunnur	3·00	1956–57 ..	1957
3 Kengal	3·00	1957–58 ..	1958
4 Kadanad	4·60	1958–59 ..	1959
5 Huppatti-1	5·00	1959–60 ..	1960
6 Huppatti-2	16·30	1960–61 ..	1961
7 Huppatti-3	7·00	1961–62 ..	1962
8 Kaguchi	13·90	1962–63 ..	1963

724. In addition to these areas, taking advantage of the co-operative idea, which is going to become a real force in village life, it is prescribed that in the following areas blue gum plantations may be raised by Kumri method through the agency of village co-operative societies in consultation with the Rural Welfare authorities.

Number and name of locality.	Acreage available in the old pyrethrum areas.
	ACS.
1 Thuneri	51·62
2 Thummanahatti	117·28
3 Iduhatti	30·11
4 Ebbanad	105·84
	304·85

725. An area of about 20 acres from any of the areas listed above will be leased out annually for potato cultivation for a period of one year and for afforestation in the succeeding year. In the second year blue gum will be planted by the lessee with the seedlings supplied by the department under the supervision of forest subordinates. In other words every year the village association will have to plant and guard 20 acres of plantation raised in the area where they raised potato previous year, in exchange for the free use of the land for growing potato. The plantations raised by them will be worked within the frame work of the working plan for the Blue Gum Working Circle, subject to the proviso that the purchaser of the coupe shall supply the produce form the fuel coupes only to the population within ten miles of the plantation area. If no co-operative effort is forthcoming, the District Forest Officer may lease out the area to the willing individuals in the village by auction. If no lessee is forthcoming the planting will be done departmentally without potato cultivation.

Section 8—Miscellaneous Blue Gum and Wattle Plantations.

726. There are many small and scattered wattle plantations which have not been included under the Wattle Working Circle of this plan. They have been found difficult to protect against the stealthy stripping off of the bark from the standing trees. They will be converted into blue gum during the course of this plan, when each in their turn is exploited. The wattle will be clear-felled at the end of nine years of its life and replanted in the succeeding year with blue gum planted at an espacement of 10 feet × 10 feet. The blue gum will be worked according to the provisions of the working plan for Blue Gum Working Circle and during the next revision of the plan such converted areas may be amalgamated with those of the Blue Gum Working Circle.

727. Similarly, such of the blue gum plantations, which have not been found convenient to be included under the Blue Gum Circle in this plan, will be worked in the same manner as those included under the Blue Gum Circle and they in conjunction with those formed either by the conversion of wattle area or by extension of blue gum plantations during the period of this plan, will be either included in the different felling series under the Blue Gum Circle or formed into new series and amalgamated with the Blue Gum Working Circle during the next revision of this plan.

Section 9—Livestock.

728. *Elephants.*—For the present thirteen elephants for timber dragging work will normally be required in Mudumalai range. Further two old elephants not useful for dragging heavy loads will be used mainly for joy rides to the sanctuary visitors on payment of hire charges. These elephants when not required for joy rides may be used for dragging light poles, etc., in the vicinity of the camp.

729. The elephant capturing operations in vogue will be continued under the management of the Mudumalai Range Officer every year. The pit method will be employed as at present. The number of pits to be covered and their location will be decided annually by the District Forest Officer. During the period the pits are kept covered, no grazing should be permitted in the capturing area. Among the elephants stationed for work in Mudumalai Range, at least four must be good Kumaki elephants.

730. *Bullocks.*—Until mechanical contrivances for obtaining water for the Kargudy colony and the rest house are established, a pair of bullocks and cart will continue to be maintained in Mudumalai Range.

Section 10—Firewood supply to Masanagudi.

731. The present practice of issuing permits for collection of fire wood in Sigur Range should be brought to an end gradually within the first three years of this plan. The permit system is not conducive for the general conservancy of the forests. To meet the demands of the local population, a small coupe of about ten acres will be sold in auction annually. The fuel coupes have been located in the vicinity of the village and are indicated on " Sigur Sandalwood coupe I " map accompanying this plan.

732. A lease period not exceeding one year may be allowed for clear felling the coupe commencing from the 1st of April every year. The Silvicultural System adopted will be the coppice system aided by artificial regeneration. In the year following the coppice, the entire area of the coupe will be taken for supplementing coppice regeneration (which is not vigorous in the locality) with artificial regeneration at an espacement of 33 feet × 33 feet. Seedlings raised in nursery will be transplanted in a small basket or kept in " moss " will be used for planting out in the field. The plants will be planted in June-July in pits dug in April and kept ready for the purpose. Where a coppice shoot occurs very near the stake no planting is necessary.

733. The species to be used are *Acacia leucophloca, Acacia arabica, Azadirachta indica, Albizzia amasa, Albizzia lebbek, Pongamia glabra, Dalbergia sisso, Prosopis juliflora.*

Section 11—Boundaries.

734. The clearance and maintenance of all reserve boundaries, for which no special provision is made, will be the work of local forest subordinates.

735. In the plateau ranges, there are many tiny reserves scattered all over the area, which renders it very difficult for the easy maintenance of the boundaries free of cost by subordinates. It is suggested that *isolated* reserves less than five acres in extent, which can neither be effectively protected nor necessary to be maintained as a reserved forest may each be examined on the merits of the case of each and such of the tiny reserves for which there is no valid reason for retention as a reserve may be disreserved. In areas, where land could be added on conveniently to the large blocks of reserves, they may be reserved by taking necessary action.

736. There is a proposal to reserve the forest areas in the vicinity of Cherambadi and Cherangode lying in Gudalur taluk. When the areas are reserved, an annual experimental planting of teak, aini (*Artocarpus hirsuta*), balsa (*Ochroma lagopus*) and *Evodia roxburhiana* should be carried out in acres to be selected by the District Forest Officer. The chosen area will be clear-felled through the agency of contractors, the right to completely clear fell and remove the growth being sold in open auction. An area of 25 acres will be taken annually, ten acres planted with teak, five acres each with aini, balsa and Evodia.

737. The cairns or pillars on the boundary lines should be kept in a state of good repair. Missing cairns should be reconstructed with the aid of the corresponding reserve maps.

Section 12—Cultivation of willows.

738. Salyx babylonica (cricket bat willow) had done well in certain swampy areas in the Nilgiri plateau. There is a great demand for willows in this country. The District Forest Officer may choose any of the swampy areas in the downs within the easy reach of Ootacamund. Any land on either bank of sluggish stream in the downs would serve

the purpose. Every year an area of about ten acres will be taken up for planting willow cuttings. An espacement of 11 feet × 11 feet will be adopted. The researches connected with the growing of willow are still in progress and hence the silviculturist may be consulted, if any cultural operation in the planted area is required to be undertaken.

Section 13—Game Sanctuary at Mudumalai.

739. An area of about 23 square miles in the forests of Mudumalai range (Gudalur taluk) was constituted in the year 1940 into a wild life sanctuary known as Mudumalai Wild Life Sanctuary (Vide G.O. No. 193, Development, dated 27th January 1940). This is the only Wild Life Sanctuary in Madras State.

740. For the preservation of the game in the sanctuary area, all shooting, hunting, etc., are prohibited. The entry into the sanctuary area is permitted only on a permit obtained for the purpose from the District Forest Officer, the Nilgiris.

741. In order to give the general public an opportunity of observing the wild life in their natural surroundings, departmental elephants with suitable seating arrangements are made available on hire.

742. In order to ensure effective protection against poachers shooting from motor vehicles, it is suggested that two gates one at Thorapalli and another at Kakkanhalla are erected and the traffic passing through in the nights stopped and checked by the staff.

Section 14—Afforestation of the Wenlock Downs and the Kundahs.

743. The Chief Conservator of Forests in his Ref. No. T.C. 462/53, dated 5th May 1953, ordered that annually an area of 300 acres should be brought under blue gum and 200 acres under wattle in the Nilgiris, in order to clothe the Downs with useful vegetation, which will meet not only the firewood needs of the general population and the requirements of eucalyptus oil and tanning industries but also help to restore the lost glory of the Downs and add to the aesthetics of the Downs by replacing with fresh vegetation the sholas that are dwindling by the repeated fires in the grassy stretches.

744. Accordingly it was decided that the planting of blue gum will be taken up in selected portions of the Wenlock Downs and that wattle cultivation will be carried out in the Kundahs near Kokothorai. This afforestation work will be in addition to the planting programme already prescribed in this working plan. Necessary schemes in this regard had been submitted and on receipt of sanction the work will be started at the respective centres.

745. The prescriptions contained in the Working Plan for the Blue Gum Working Circle and the Wattle Working Circle will apply *mutatis mutandis* to the blue gum planting to be done in the Wenlock Downs and the wattle planting to be done near Kokothorai.

746. An additional staff of two foresters and two plantation watchers is necessary for the afforestation work in Wenlock Downs. Similar additional staff for the work in Kokkothorai is also necessary.

747. The blocks suitable for the afforestation work had been indicated in the maps that accompany this plan. The areas marked include shola patches lying in the folds of the Downs; the sholas will be retained as they are, and the planting will be confined only to the grassy lands. Small patches may have to be excluded if they are found swampy and rocky. The annual area to be planted will be located in units of 50 to 100 acres, in the case of Wenlock Downs, so that the blue gum plantations formed may be dotted all over the Downs (with due regard to extraction facilities) instead of lying in compact blocks over an extensive area. The aim is that utility and aesthetics should be effectively combined so that the plantations are formed the amidst the rolling grass-lands. While marking the suitable areas, in particular the area lying south of the Mysore road between the 8th and the 9th mile had been excluded as the area gives a panoramic view of the Mukurti and the Nilgiri peaks lying beyond a pretty patch of the Downs. While locating the afforestation units, areas required for grazing around the munds and the hundis and areas required by the Hunt Club will be excluded. In the case of wattle planting near Kokothorai, the annual planting area will normally be a compact block.

748. The total annual planting area will be 300 acres in the Wenlock Downs. In the case of Kokothorai area, in the first year 100 acres will be planted, in the second year 150 acres and thereafter 200 acres per annum.

749. In Kokotharai, a labour line to house about twenty families will have to be constructed in order to have sufficient labour for the afforestation work. Each family will be allotted half an acre of land so that they may raise for themselves any crop they

desire. This is necessary to attract labour to the locality and to make them settle in the colony permanently. As the forest operations are mainly seasonal, the facility for cultivation will afford them a fairly comfortable livelihood.

Section 15—Control.

750. *The Control Journal.*—The object of this journal is to secure a running commentary on all aspects of the divisional administration. Herein will be recorded all noteworthy occurrences bearing on the management and improvement of the forest of the division. The main object of the journal is to record important observations and such information not available in the Control forms and the Record of Works. The journal will be maintained in one loose leaf file for the whole division. A separate set of sheets will be allotted to each working circle and a final set of miscellaneous matters. A summary of annual revenue and expenditure in a form to facilitate comparison with the financial forecast in this plan will also be recorded every year. The journal is supplied to the District Forest Officer with the necessary headings. Additional headings may be included by the District Forest Officer while making the entries in the journal. The journal should be written by the District Forest Officer himself. A copy of the entries made during the year should be submitted to the Conservator of Forests, Ootacamund Circle, soon after the close of each financial year.

751. *The Control Book and the Record of Works.*—A set of control forms for each working circle is supplied to the District Forest Officer to make annual entries regarding (1) the actual exploitation and yield against the prescribed items and (2) the works carried out in each working circle other than the main exploitation operations. Separate forms are provided for measures prescribed, for measures suggested and for measures neither prescribed nor suggested but carried out. The control forms and the record of works should be written up soon after the close of each year. The copy intended for the scrutiny of the Controlling Authority should be submitted annually along with the deviation statements.

CHAPTER XII.

Establishment and Labour.

Section 1—Establishment.

752. In view of the increased planting programme and the increased number of leases due to many areas being offered for exploitation, the bulk of routine office work in the District Forest Office would increase gradually. The appointment of one lower division clerk in addition to the present staff will be necessary from 1955–56 onwards.

753. In order to improve the sanitation of Mudumalai Range Forest colony one scavenger is absolutely essential. He will also attend to the Kargudy Rest House sanitary fittings and keep them clean.

754. At present there are only few beats which have reserve watchers. In order to keep the boundaries of the reserves in good condition as well as to make the protection of the beat effective, it is necessary that all beats in this division should have one reserve watcher for each beat.

755. A forester and plantation watcher are necessary for Sholur Wattle Series. If the schemes for the afforestation of the Kundahs and the Downs referred to in paragraphs 739 to 749 are sanctioned, 4 foresters and 8 plantation watchers will be necessary.

Section 2—Labour.

756. Labour presents acute problems especially in the remote wattle planting areas and in Mudumalai range. Though labour is available for works in the plateau ranges, in view of the increased wages offered by the potato growers, it is difficult to get cheap and efficient labour.

757. Labour lines are existent for the Brookhampton Pyrethrum area and Mukurti Wattle Plantations. A similar set of labour lines will have to be constructed for housing the labourers required for Avalanche Wattle Series. If the scheme for the afforestation of Kundahs (planting of wattle at 200 acres per annum near Kokothorai) is sanctioned, labour lines will also have to be erected there. Small patches of land not exceeding half an acre per family should be leased out to the labourers residing in the labour lines so that they may have an incentive to settle in the area.

758. In Mudumalai range, land may be granted on a small scale (especially the swampy patches carrying no forest growth can easily be cultivated with paddy) to those who are willing to settle and supply labour for forest works from members of their family residing in the settlement. It is also suggested that permanent colonies of the local jungle tribes of Kurumbars may be formed near Teppakadu, Thorapalli and Lower Kargudy by leasing few acres of land for cultivation.

759. It is also suggested that a motor lorry is purchased for the division and attached to Ootacamund South Range Officer. The lorry will be mainly used to transport labour to the work spots where labour do not reside in the vicinity. The number of working hours of the labour employed which the department will gain by the provision of such quick transport will be considerable. Under a programme approved by the District Forest Officer, the lorry will make necessary trips each day to transport labour to the work spots in Ootacamund North and South Ranges.

CHAPTER XIII.

Financial Forecast and Cost of the Working Plan.

760. The following statements show :—

(1) The estimated revenue and expenditure in respect of each working circle for the period of this plan ; and

(2) An abstract of the forecast.

1. *The Blue Gum Working Circle—*

Year.	Revenue in rupees.	Expenditure in rupees.
1954–55	1,12,650	5,660
1955–56	1,21,390	3,990
1956–57	1,03,140	3,500
1957–58	95,050	4,180
1958–59	1,03,620	4,380
1959–60	1,09,370	2,780
1960–61	1,13,150	3,020
1961–62	1,11,250	1,580
1962–63	1,03,740	2,060
1963–64	1,19,840	2,820

2. *The Wattle Working Circle—*

1954–55	13,000	25,920
1955–56	13,000	33,380
1956–57	34,600	19,380
1957–58	28,000	11,620
1958–59	33,400	10,920
1959–60	28,000	11,550
1960–61	1,41,400	10,920
1961–62	1,37,200	15,825
1962–63	1,41,400	18,300
1963–64	1,33,600	17,745

3. *The Pyrethrum Working Circle—*

1954–55	54,000	60,770
1955–56	1,06,000	81,820
1956–57	1,27,550	88,420
1957–58	1,37,700	90,940
1958–59	1,34,400	91,360
1959–60	1,34,650	91,550
1960–61	1,34,250	91,270
1961–62	1,36,450	91,390
1962–63	1,36,200	91,240
1963–64	1,38,400	91,360

Year.	Revenue in rupees.	Expenditure in rupees.
4. *The Selection Working Circle—*		
1954–55	1,26,000	23,500
1955–56	1,59,000	29,000
1956–57	1,80,000	33,500
1957–58	1,62,000	29,500
1958–59	1,62,000	29,500
1959–60	2,49,000	48,000
1960–61	2,64,000	57,500
1961–62	1,26,000	23,500
1962–63	1,17,000	22,000
1963–64	1,44,000	26,500
5. *The Teak Working Circle—*		
1954–55	46,300	3,540
1955–56	1,63,500	35,060
1956–57	37,900	3,390
1957–58	92,900	18,780
1958–59	41,100	3,600
1959–60	36,100	2,970
1960–61	61,300	4,610
1961–62	58,500	4,410
1962–63	60,100	4,530
1963–64	43,900	3,380

6. *The Sandalwood Working Circle.*—Annually a revenue of Rs. 99,000 and an expenditure of Rs. 6,000 are expected.

7. *The Bamboo Working Circle.*—An annual income of Rs. 3,000 is expected. No expenditure is anticipated.

8. *The Grazing Working Circle.*—An annual revenue of Rs. 3,200 and an annual expenditure of Rs. 50 are expected.

9. *The Minor Forest Produce Working Circle.*—An annual revenue of Rs. 12,000 and an annual expenditure of Rs. 100 are expected.

10. *Miscellaneous.*—Some of the prescriptions like the construction of new buildings, clearfelling and regeneration in Cherambadi and Cherangode forests are likely to be given effect to only during the later part of the period of this plan. Hence an annual income of Rs. 50,000 and an annual expenditure of Rs. 1,90,000 (including establishment charges) are expected for the first five years. Later the corresponding figures would be Rs. 60,000 and Rs. 2,20,000 respectively. These estimates do not include the cost of the large scale afforestation work in the Kundahs and the Wenlock Downs. The expenditure for that work would on an average be about Rs. 35,000 per annum.

11. *Abstract of the forecast.*—The total income and expenditure for the whole division (including the cost of afforestation in the Kundahs and the Wenlock Downs) for each year, is estimated as follows :—

Year.	Revenue in rupees.	Expenditure in rupees.	Surplus in rupees.
1954–55	5,16,150	3,50,540	1,65,610
1955–56	7,30,090	4,14,400	3,15,690
1956–57	6,50,390	3,79,340	2,71,050
1957–58	6,82,850	3,86,170	2,96,680
1958–59	6,41,720	3,70,910	2,70,810
1959–60	7,34,320	4,18,000	3,16,320
1960–61	8,91,300	4,28,470	4,62,830
1961–62	7,46,600	3,97,855	3,48,745
1962–63	7,35,640	3,99,280	3,36,360
1963–64	7,56,940	4,02,955	3,53,985

761. The foregoing abstract of estimated revenue and expenditure does not include the share or charges on account of the Conservator of Forests, Ootacamund Circle and his establishment at the rate of Rs. 14,000 per annum. Including the share of the direction office charges, the Nilgiris Division will have on an average a surplus of about two lakhs of rupees per annum in the first five years and about 3½ lakhs of rupees per annum in the succeeding five years.

Section 2—The cost of the Working Plan.

762. The cost of the preparation of this Working Plan, including the share of direction charges relating to the Conservator of Forests, Working Plan Circle, and his establishment during the period of preparation of this plan is as below :—

Particulars. (1)	Expenditure in the Working Plan Division, the Nilgiris. (2)			Expenditure towards the share of (one-fifth of the total) direction charges of the working plan circle office. (3)			Total. (4)		
	RS.	A.	P.	RS.	A.	P.	RS.	A.	P.
Pay of officers	9,463	7	0	9,032	0	0	18,495	7	0
Pay of establishment ..	19,179	9	0	4,022	10	0	23,202	3	0
Travelling allowances ..	10,921	0	0	2,099	6	0	13,020	6	0
Fixed travelling allowances..	2,794	11	0	..			2,794	11	0
Other compensatory allowances.	4,430	4	0	875	12	0	5,306	0	0
Dearness allowances ..	9,416	2	0	2,103	7	0	11,519	9	0
Contingencies	1,197	9	6	721	10	0	1,919	3	6
Works	2,797	2	0	469	12	0	3,266	14	0
Total ..	60,199	12	6	19,324	9	0	79,524	5	6

763. One Working Plan Officer in the category of Assistant Conservator of Forests in the Madras Forest Service, two Rangers, seven foresters, one clerk and four peons formed the establishment of this Working Plan Division.

764. The Division was formed on 28th August 1951 and closed on 1st July 1953.

SUMMARY OF PRESCRIPTIONS.

CHAPTER I—BASIS OF PROPOSALS.

PARAGRAPHS.

Scope.—This working plan deals with the whole of the Nilgiris Division 313

Objects of management.—The objects of management are (1) to exploit, subject to silvicultural principles, the resources of the forests in firewood, timber, sandalwood, bamboo and minor forest produce: (2) to raise plantations of bluegum for firewood, wattle for tanning bark, and teak for timber and thus increase the value of the forests of the division; (3) to supply as far as is compatible with the requirements of forest conservancy, the pastoral and the domestic needs of the population ; (4) to preserve the beauty and integrity of the sholas of the Nilgiris plateau which lie in the catchment area of the Bhavani and the Moyar ; (5) to grow pyrethrum to meet the needs of the pyrethrum insecticide requirements of the State ; (6) to grow on a small scale the cricket-bat willow in the swampy areas of the Downs; and (7) to provide better amenities for the accommodation of the subordinates especially of Mudumalai and Sigur Ranges 313

Working circles.—The following working circles have been constituted :— 314

	ACS.
1 The Blue gum Working Circle	2,493
2 The Wattle Working Circle	3,434
3 The Pyrethrum Working Circle	639
4 The Selection Working Circle	33,924
5 The Teak Working Circle	1,981
6 The Sandalwood Working Circle	88,824
7 The Bamboo Working Circle	5,422
8 The Grazing Working Circle	31,317
9 The Minor Forest Produce Working Circle	All the reserves and unreserves of the Division.

Period of the working plan.—This working plan will be in force for a period of ten years from 1st April 1954 to 31st March 1964. Indications regarding the areas to be worked in the succeeding five years have also been made as a guide for work to be carried on in case there happens to be any delay in taking up the revision before this plan lapses 316

CHAPTER II—THE BLUEGUM WORKING CIRCLE.

PARAGRAPHS.

Constitution of the working circle.—This working circle includes (1) all areas which were under the coppice working circle of the previous plan, (2) areas of Hardwood Eucalyptus to be converted into bluegum, (3) scattered wattle plantation areas converted into bluegum and (4) areas outside the last working plan which were brought under bluegum. The area under bluegum had been increased to meet the requirements of the expanding market 317

Area of the working circle and felling series.—The total area of the working circle is 2,493. There will be 12 felling series, six in Ootacamund North range, two in Ootacamund South range and four in Coonoor range. Details of blocks and compartments included in this working circle given .. .. 318 and 320 to 324

Analysis of the crop.—Out of 2,493 acres included in the working circle about 6·2 per cent of the total area will fall under the first quality, 47·3 per cent under the second quality and 46·5 per cent under the third quality 325

With the establishment of a regular succession of age gradations according to the prescription of the plan an annual sustained yield about 15,000 tons will be available 327

There is great abnormality in the distribution of the different age gradations mainly due to advance fellings during the days of the World War II and failure to undertake the revision of the last plan before it lapsed .. .. 328 to 330

Method of treatment.—The treatment proposed is (1) to clearfell the bluegum plantations under the simple coppice system for meeting the firewood requirements of the local neighbouring population, (2) to convert the other plantations included in this working circle under bluegum, (3) to plant with bluegum the grassy areas contiguous to the old compartments and to afforest the area demarcated for the Glenmorgan Series and (4) to replant with bluegum, the bluegum coppice areas, at the end of four coppice rotations 331

Silvicultural system.—The silvicultural system adopted will be mainly the simple coppice system except where clearfelling is followed by concentrated artificial regeneration. In the case of grassy areas planted up for the first time it will be a case of afforestation by concentrated artificial regenerations 332

Rotation.—The coppice rotation is fixed at 15 years and the reasons for its adoption are discussed .. .. 333 to 337

Regulation of yield.—The yield will be regulated by "reduced" area the actual area of each compartment having been reduced to a common quality dependant on the mean quality of the crop in the compartment, before being distributed for the 15 annual cuttings 338

The yield expected to be obtained annually as derived from the mean outturn sales is given 339

Method of execution of fellings.—All trees in the areas allotted for the year will be completely felled except for a row of trees on the periphery which will be retained while the other trees in the area are coppiced. The areas will be sold as fuel coupes each year 340

The felled material will be stacked before removal. The size of a standard firewood stack is 8 feet × 5 feet × 3 feet. The contractor may also remove material in the form of timber or in any other fashion 341

The compartments allotted for the year will be sold twice in a year. One set of the compartments allotted for the year will be sold with a lease period commencing from the 1st of April and the rest as a second set with the lease period commencing from the 1st of October so as to achieve uniformity of supplies as well as to have a shorter period of lease due to the smallness of each lease unit 342

All areas will be surveyed before they are offered for sale 343

The row of bluegum trees retained on the periphery of each compartment during the coppice fellings will be cut down when the area is clearfelled at the end of four coppice rotation, i.e., when they are 60 years old. The peripheral standards apart from demarcating the edge of the compartments also aid to some extent as a wind belt and incidentally serve the limited timber requirements for rough constructional works in the plateau. When the area is replanted a row of trees along the margin will also be planted up 344

A detailed statement of the areas to be felled in different years is given .. .. 345 and 346

Regulation of regeneration operations.—All areas other than under bluegum when clearfelled will be planted up with bluegum. Bluegum areas will be replanted with bluegum at the end of four coppice rotations. Planting or replanting will be done in the year following the felling 347

Details of areas to be planted or replanted with bluegum in the different years are given .. .. 348 and 349

PARAGRAPHS.

Planting will be done with the onset of the south-west monsoon rains. Nursery raised "Mossed" seedlings will be used. An espacement of 10 feet × 10 feet will be adopted. Wherever is possible to get men to do potato cultivation, it will be encouraged in areas where the general slope is less than 1 in 5, as the soil working and the residual manure left in the area after the cultivation revitalizes the soil and helps in the easy establishment of the bluegum. The cultivation will not be for more than one year in the interests of soil conservation. The planting of bluegum will be done departmentally. Details of planting nursery weedings, and frost cover are given .. .. 350 to 361

Subsidiary silvicultural regulations.—In order to meet the demands of the Eucalyptus oil industry rotational lopping of bluegum leaves retaining a crown length 10 feet from the top is prescribed. The loppings will be done normally in the ninth and fourteenth years of the plantation. The leaves from the residual crown will be exploited when the trees are felled at the close of the fifteenth year according to the rotation fixed. Details regarding the lopping programme are furnished .. 363 to 366

Other regulations.—A careful and complete record of the fellings and the outturn realized will be maintained 367

Compartment boards will be correctly maintained and they will be renewed whenever necessary in April 368

CHAPTER III—WATTLE WORKING CIRCLE.

Constitution of the working circle.—To meet the increased demand of the wattle bark in the tanning industry, a wattle working circle is constituted. The wood from the trees would incidentally meet the firewood requirements of the population nearby and the afforestation will aid in the regulation of the flow of waters to the different Hydro-Electric and Irrigation Projects connected with the streams rising from the Nilgiris 370

Area of the working circle.—The wattle working circle will be 3,435 acres in extent and will include the new wattle plantations, that will be raised under this working circle during the period of the plan and some of the wattle plantations already raised in the recent past .. .. 371 to 373

Felling series.—There will be four felling series, one in Ootacamund North Range, two in Ootacamund South Range and the other will be mostly in Coonoor Range. 374

Details of blocks and compartments included in this working circle are furnished .. 375 to 379

Method of treatment.—The treatment proposed is (1) to clearfell the wattle areas on a rotation of nine years for the exploitation of bark and incidentally for firewood, (2) to plant the new areas with black wattle and thus increase the acreage under wattle, (3) to replace entirely with black wattle the areas where there is an admixture of black and green wattle, (4) to regenerate "naturally" the areas where the black wattle stands are clearfelled and (5) to supplement with artificial regeneration in cases where the natural regeneration is not successful .. .. 380 to 384

Silvicultural system.—The silvicultural system adopted will be the clearfelling system followed by artificial or concentrated regeneration as the case may be. In the grassy areas where planting is done for the first time it will be a case of afforestation with concentrated artificial regeneration 385

Choice of species.—Only *Acacia mollissima* (the black wattle) will be planted ... 386

Rotation.—A rotation of nine years will be adopted. The reasons for its adoption are discussed .. .. 387 to 394

Regulation of yield.—The yield will be regulated by area. The yield expected annually is given based on the average outturn obtained in the past in this locality. 395 and 396

Method of executing the fellings.—The areas allotted for the year will be exploited through the agency of contractors who will have the right to collect and remove both the bark and the wood obtained from the standing growth sold to them. Where there are wind belts of bluegum they will be excluded from the sale. The lease period will be for ten months commencing from the 1st April of the year. All trees in the area except those in the wind belts will be completely clearfelled. The firewood should be stacked before removal. The size of standard firewood stack is 8 feet × 5 feet × 3 feet. The quantity of bark removed will also be furnished by the contractor periodically .. .. 397 to 400

All areas will be surveyed before they are offered for sale 401

In the areas where the clearfelling is to be followed by natural regeneration the contractor will be required to pile up the brush wood, which he is not going to remove, along the contours at distances not less than one chain along the slope. The orderly disposal of the brushwood plays a great part in the re-establishment of the wattle crop by natural regeneration. Details regarding the piling up of brushwood are given 402

PARAGRAPHS.

The areas to be felled annually are furnished 403

Regulation of regeneration operations.—Normally natural regeneration will be resorted to in all areas where a black wattle crop is clearfelled. In areas where there is an admixture of the black and green wattles, the entire area will be re-planted with black wattle seedlings. New areas included in the working circle will be planted up with black wattle seedlings. The details of the areas to be planted each year are furnished 404

Wattle will be planted at an espacement of 11 feet × 11 feet. For every 60 rows of wattle planted there will be a wind belt of 11 rows of bluegum planted 6 feet apart. The wind belts will be raised in advance of wattle planting in order that they may serve the purpose for which they are intended during the first rotation itself .. .. 405 and 406

In the case of wattle plantations included in the Sholur and the Badaganad series, there will be only a peripheral wind belt (six rows of bluegum six feet apart) in view of the smallness of the annual areas 407

The wind belts will not be felled when the wattle is clearfelled 408

Artificial regenerations with black wattle.—Black wattle seedlings raised in nursery and "mossed" will be planted in prepared pits with the onset of south-west monsoon rains at an espacement of 11 feet × 11 feet. In the case of plantations to be raised in Avalanche series, wherever possible wattle will be raised in conjunction with potato cultivation. Not more than one year's cultivation will be permitted in view of soil conservancy. The planting will be done departmentally in all cases. In areas where no potato cultivation is done four ounces of fertilizers will be added to each pit where the wattle is planted. This causes a rapid establishment and reduces the casuality due to frost in the first winter. Details regarding the planting, nursery, weeding and frost protection are given .. .. 410 to 421

Natural regeneration with black wattle.—Natural regeneration springs up in profusion in the clearfelled wattle areas with suitable soil preparation. Weeding of the competing growth and the spacing of the plants in stages to the required number will be done. In order to reduce the cost of maintenance and tending of the natural regrowth, it is essential to concentrate as much of the natural regeneration as possible along the definite strips. The preparation of the soil will be confined to one foot wide strips 11 feet apart from each other. The strips will be along the contour. The soil in the strips will be lightly raked up to brake the humus mat and mix the mineral soil and the humus on which lie the fallen seeds. While preparing the soil along the strips fertilizers (mostly of superphosphate) will be added at the rate of one pound per 33 running feet. Details regarding the weedings to be done and the soil operations to be carried out are furnished .. .. 422 to 426

Subsidiary Silvicultural regulations.—Wattle requires early and heavy thinnings. It suffers greatly from competition due to its superficial lateral root system. The major thinning operations will have to be completed before the end of the third year. In the month of March following the first winter the plants in the strips will be spaced out about five feet apart in the natural regeneration areas thus attaining about 800 stems per acre. An enumoration of the growing stock will be made after the first thinning 427

In May-June following the 1st thinning where there are failures over a length of one chain distance or more in the strips artificial planting ten feet apart will be done along the strips .. .. 428 and 429

The second thinning will be done where the plants obtained by natural regeneration complete two years of their life and enter the third year of their existence. This will reduce the crop to 400 stems per acre which will be the optimum number required in the locality for the maximum yield of bark under the rotation fixed.*
Details regarding the operation to be carried out are given .. .. 427 to 432

Other regulations.—A careful record of the felling and yield of bark and wood obtained will be maintained 433

The compartment boards will be correctly maintained and renewed wherever necessary in April 434

All wattle plantations will have a scraped fire line nine feet wide on the periphery. Internal lines for inspections to a width of six feet will be maintained, which will also as internal fire breaks 435

A set of labour lines will be maintained for the Mukurti and Avalanche centres and the labour provided with reasonable facilities 436

Details regarding additional staff indicated 437

Each wattle stand between two wind belts in the case of plantations in Mukurti and Avalanche series will be surveyed as soon as the plantation of the year is completed so as to locate the sub-compartments and their areas 438

PARAGRAPHS

Research on the isolation of high yielding clonal strains, hybridization, estimation of tannin content which varies with age, etc., are suggested. The preparation of a revised yield is also indicated .. .. 439 to 441

Disposal of wood from wattle areas 442

To avoid evil effects of hybridization all wattle other than black wattle in the vicinity of the black wattle plantations will be cut down 443

A journal will be maintained to record all relevant facts regarding each wattle area. 444

CHAPTER IV—THE PYRETHRUM WORKING CIRCLE.

Constitution of the Working Circle.—To meet the pyrethrum insecticide requirements of the Madras State, pyrethrum will be planted in the Nilgiris so that an annual production of about 60,000 lb. of dry flowers may be possible 446

Area of the Working Circle.—The area of the working circle is 639·03 acres 447

Planting Series.—There will be three planting series, viz., Brookhampton, Muthinad and Ree's corner 448

Details of the units constituting each planting series are furnished .. .. .. 449 to 453

Analysis of the crop.—At the time of the preparation of the plan only three plantations measuring in all 42 acres are available. The rest of the area will be brought under Pyrethrum during the period of the plan .. .. 454 to 456

Method of treatment.—The treatment proposed is (1) to plant with pyrethrum the areas included in the working circle, (2) to collect departmentally the pyrethrum flowers, dry them and store them properly for despatch to the factory for the extraction of pyrethrum, (3) to rotate the pyrethrum crop once in five years with winter wheat and (4) to replant with pyrethrum the areas after harvesting of the wheat 457

Silvicultural System.—The system adopted would correspond to the clear-felling system followed by concentrated artificial regeneration 458

Rotation.—The rotation is fixed at five years. The pyrethrum crop will be retained for four summers and the area rotated with winter wheat in the fifth year .. 459

Yield.—The yield will be regulated by area. When all the plantations in the different series are established an annual output of about 60,000 lb. of dry pyrethrum flowers is expected .. .. 460 to 462

Regulation of planting operations.—The details of planting programme furnished. An annual planting of about 125 acres is prescribed .. .. 463 to 465

The area to be planted will be forked and completely weeded .. .. .. 466 to 468

A grass belt of six feet width along the contour will be left intact for every 15 feet vertical interval of pyrethrum planted. Contour drains are also prescribed as a soil conservation measure 466

The planting of pyrethrum will be done in rows two feet apart with plants two feet from each other in the row and the planting so done that the rows lie along the contour 469

The planting will be done with the onset of monsoon usually in May. Nursery seedlings or splits will be used. Weedings will be done thrice in a year .. 470 and 471

Details regarding nursery practice are furnished .. .. 472 to 475

Method of exploitation.—The flowers will be collected departmentally dried and stored for despatch to the factory .. .. 476 to 480

Subsidiary Cultural operations.—After the flowers have been collected for 4 summers, the pyrethrum crop will be replaced by a wheat crop raised in winter. The cultivation of wheat will be done departmentally to avoid the risk of the lessees adding fertilizers to the soil which generally have an adverse effect on the succeeding pyrethrum crop. In areas where potato had been raised using fertilizers, the acidity resulting in the soil caused many a pyrethrum plantation fail, when pyrethrum was raised immediately after the potato crop .. .. 481 to 483

Details of areas to be rotated with wheat are furnished 484

Other regulations.—Research regarding the isolation of high yielding clonal strains both regarding total output of flowers and pyrethrum content is indicated .. 485

Three kiln drivers will be maintained 486

All Pyrethrum fields will be fenced. A row of bluegum plants will also be raised along the wire fence during the period of this plan 487

Details regarding the collection of seeds and maintenance of plantation journals are given .. .. 488 and 489

Chapter V—The Selection Working Circle.

	Paragraphs
Constitution of the working circle.—The working circle includes 30 compartments situated in Mudumalai Range	491
Object of management.—The object of the working circle is to exploit mature saleable timber with due silvicultural safeguards and to carry out suitable cultural operations to improve the condition and composition of the crop	492
Area of the working circle.—The gross area of the compartments included in this working circle is 34,875 acres of which 951 acres are occupied by Teak Plantations. The net area of the working circle is therefore 33,924 acres	493
Blocks and compartments.—Details of blocks and compartments are furnished ..	494 and 495
Description of the compartments is found in Appendix XIV	496
The position of the compartments and stock in them are shown in the maps accompanying the plan	497
Analysis of the crop.—The areas included contain mostly moist deciduous and dry teak type of forests. Results of enumeration based on 10 per cent stratified random sampling are given	498 to 502
Method of treatment.—The problems and difficulties in the management of Mudumalai forests are detailed	503 and 504
The treatment proposed is to exploit mature saleable species and to carry out subsidiary silvicultural operations for the improvement of the crop	505
Exploitable size.—Trees of and above six feet girth at breast height will be exploited subject to certain conditions given in paragraphs 516 and 522	506
Choice of species.—Among the species available *Tectona grandis, Terminalia tomentosa, Pterocarpus Marsupium, Lagaerstroemia lanceolata, Dalbergia latifolia, Grewia tiliaefolia, Bombax malabaricum* are saleable. If any demand arises of any other species they may also be exploited	507
Silvicultural system.—The silvicultural system adopted will be the selection system ..	508
Rotation.—The rotation is fixed at 150 years, the age corresponding to the exploitable girth under natural forest conditions	509
Felling cycle.—A felling cycle of 30 years is adopted	510
Yield.—Yield will be regulated by area and by the number of exploitable trees from each compartment as determined by Smythies' Safeguarding Formula method ..	511 to 514
Method of executing the fellings.—The marking felling and extraction will be done departmentally	515
The rules regarding the marking are given	516
The period for working each compartment is one year commencing from the first April	517 to 521
Details regarding departmental exploitation are given. The timber will normally be sold in Nanjangode sale depot (Wynaad Division) and timber not fit for transport to Nanjangode will be sold locally	521
A tabular statement showing the area to be taken for selection felling annually as well as the maximum number of exploitable trees that could be removed in each compartment is furnished	522
The areas to be taken up in the succeeding five years in case there is delay in revision, are given	523
The probable yield from each compartment to be worked during the period of plan is furnished	524
Subsidiary silvicultural regulations.—The subsidiary silvicultural operations will be carried out in the compartments where the selection felling is done, in the same year in order to facilitate check. The operations will mainly consist of (1) cutting back of badly shaped or damaged teak saplings below one foot in girth, (2) freeing from suppression advance growth and young trees of saleable species by cutting of branches of the other species which are found to actively interfering with the useful young growth, (3) climber cutting and (4) thinning of coppice shoots ..	525 to 528
Details regarding the areas where the operations are to be carried out annually are furnished	529 and 530
Other regulations.—The maintenance of block and compartments lines are prescribed.	531
The maintenance of compartment boards and their renewal, if any, prescribed ..	532 and 533

CHAPTER VI—THE TEAK WORKING CIRCLE.

	PARAGRAPHS
Constitution of the working circle.—This working circle includes all teak plantations raised in Mudumalai and Sigur Ranges and the areas proposed for conversion ..	535
Area of the working circle.—The area of the working circle is 1,982 acres, of which 1,153 acres are already under teak	536
Blocks and compartments.—A list of teak plantations included in this working circle is given	537 to 540
Description of the plantations is given in Appendix XV	
Detailed maps of the teak plantations and the areas proposed for conversion accompany this plan	
Analysis of the crop.—Though teak planting began in this division in 1863, continual annual planting was done only from 1924. No planting was done in the years 1945 to 1947 due to the occupation of the Mudumalai forests by the Military camp	541
The area taken up for conversion (compartments 5) is a mixed deciduous type of forest containing some of the principal timber species of South India	
Details of the results of enumeration done by 10 per cent stratified random sampling in the areas proposed for conversion are given	543
All suitable areas in compartment five will be planted with Teak before any other compartment is taken up for conversion	544
The necessity to create teak plantaions in this locality is in view of the past preferential exploitation of teak and the general degradation of the forests due to annual fires. Though a high quality teak plantation will not result, it will be a compensatory plantation for fellings carried out under selection system and the general failure of natural regeneration of useful species	545
Annually an area of 30 acres will be clearfelled and planted	546
Silvicultural system.—The *silvicultural* system adopted will the clear felling system followed by concentrated artificial regeneration	547
Rotation.—The rotation is fixed at 70 years and the reasons therefor given ..	548 to 551
Choice of species.—*Tectona grandis* will be introduced over the entire area. In swampy patches Terminalia tomentosa will be planted. Any species naturally occurring in the area if not found interfering with teak will be retained as a measure of entomological control of teak depliators	552
Method executing the fellings.—All plantations which are to be clearfelled will be exploited deparmentally. All areas which are chosen for conversion will be exploited through the agency of contractors	553 to 555
Details regarding marking and estimation of volume as well as regarding conversion and classification are given	556 to 560
A statement showing areas to be taken up for the annual clearing and the probable outturn is given	561 to 565
Regulation of regeneration operations.—The unsaleable growth will be cleared before the end of January and the slash from the rubbish fellings burnt uniformly before March	566 and 567
Aligning and staking at 6 feet × 6 feet will be done	568
One year old teak stumps will be planted with the onset of premonsoon shares usually between the 15th April and the 15th of May	569 and 570
No departmental Kumri will be done, but if Kumridars are forthcoming the area may be leased out for raising ragi or other suitable crop for one or two years ..	571
Details regarding the weedings and cleanings to be done in order to establish the young teak are given	572 to 579
Subsidiary silvicultural regulations.—The nature of thinnings to be carried out for the development of the timber crop and the thinning cycle are discussed and prescribed. Thinnings will be done in the 6th, 12th, 19th, 27th and 36th years. A table to show the normal number of stems per acre and the average crop espacement after each thinning is given as a guide for the marking officer to regulate the intensity of thinnings. A tabular statement showing the areas to be taken up for thinning is given	580 to 587
Other regulations.—The maintenance and renewal, if any, of plantation boards are prescribed. Maintenance of surveyed sketches of the future plantations prescribed in order to aid the next revision	588 and 589
Maintenance of the plantations prescribed	590

Chapter VII—The Sandalwood Working Circle.

PARAGRAPHS

Constitution of the working circle.—The Sandalwood Working Circle includes all sandal areas in the reserves and unreserves of Coonoor and Sigur Ranges 592

Enumeration and stock mapping.—The sandal areas have been enumerated by 10 per cent stratified systematic sampling noting the number of healthy, spiked and dead sandal trees. The sandal patches have been indicated on the accompanying maps in three densities, viz., dense, sparse and scattered 593

The working circle has an aggregate area of 88,124 acres of which the effective sandal area is 13,861 acres 594

Felling series.—Two felling series had been constituted, viz., the Coonoor Felling Series and the Sigur Felling Series. Details of the felling series are furnished .. 595 to 599

Analysis of the crop.—The total number of trees in the different felling series, classified into three classes, viz., healthy, spiked and dead are given. Based on the results of sampling, about 3 per cent of trees in Coonoor series and about 7 per cent of trees in Sigur series are spiked. About 17 per cent are dead in each series .. .. 600 to 603

Method of treatment.—Only dead trees will be extracted by uprootals of the stems. Natural regeneration will be depended upon for restocking the area .. 604

Felling cycle.—A felling cycle of three years is adopted as each coupe has to be working again at frequently short intervals to reduce the possibility of theft of dead sandal 605

Coupes.—Each series is divided into three convenient annual coupes 606

Yield.—The yield will be regulated by area and the actual output will depend upon the mortality per cent 607

Method of executing the fellings.—Completely dead trees over 3 inches in girth at breast height will be enumerated and exploited .. .. 608 to 610

All operations in connection with the extraction work will be carried out departmentally. The rough cleaned wood will be despatched for sale at Satyamangalam Sandalwood Sale Depot in Coimbatore North Division .. ..

A statement is given showing the coupes to be annually worked. The boundary description of each coupe is also furnished 611

Subsidiary Silvicutural Regulations.—General tending of the young growing stock of sandal will be done at the time of marking. Species known to render the sandal susceptible to spike if found within a radius of three yards of a sandal tree will be cut down. If any species is found actively interfering with sandal trees over four feet in height, the interfering branches will be cut, and the trees freed from suppression climber cutting is also prescribed 612

Other regulations.—Research for the isolation of spike resistant strains for clonal propogation is indicated 613

Chapter VIII—The Bamboo Working Circle.

Constitution of the working circle.—The working circle includes all areas in Coonoor Range where bamboos occur in workable quanities 615

Area of the working circle.—The area of the working circle is 5,422 acres, the effective area under Bamboo being 1,516 acres 616

Felling series.—The details of the two felling series, viz., the Hulikal Felling Series and the Vagappanai Felling Series are furnished 617

Analysis of the crop.—Both *Bambosa arundinacea* and *Dendrocalamus srtictus* occur mixed to varying degrees all over the tract 618

Stock mapping and enumeration of clumps were done on a 10 per cent stratified sys—tematic sampling 619

The bamboo areas have been shown in maps in two densities, viz., dense and sparse .. 620

On an average a clump carried about 13 culms in this locality 621

Method of treatment.— A felling cycle of three years will be adopted. The bamboos will be exploited through the agency of contractors. Selected culms from each clump will be felled subject to the conditions given in paragraph 627 .. .. 622 to 625

Method of executing the fellings.—One coupe will be annually exploited in each series .. 626

A set of rules to regulate the felling is prescribed 627

Details regarding the coupes are furnished in a tabular statement 628

CHAPTER IX—THE GRAZING WORKING CIRCLE.

	PARAGRAPH
Constitution of the working circle.—The working circle covers the entire division except the areas specifically closed for grazing	631
Closure to grazing.—Details of the areas closed to grazing are furnished	632 to 635
A grazing notification will be published annually specifying the areas closed to grazing and the conditions regulating the grazing	636
Method of treatment.—Grazing will be regulated by issues of permits	637 to 639
Penning.—Licences for penning cattle at approved pens will be issued at prescribed rates	640
Free grazing Concessions.—Particulars of cases of free grazing concessions are furnished	641 to 645
Regulation regarding the Mysore cattle grazing in the forests of this division	646
Removal of grass.—The conditions regulating the removal of grass are given	647
Rotational burning in the kundahs.—In order to meet the peculiar needs of the Toda and Badaga cattle and to avoid the risk of extensive fires a rotational burning of portions of the grassy stretches in the Kundahs is prescribed. The details of the Badaga Hundis and Toda munds are given. The burning will be done on a cycle of two years by the graziers themselves under the departmental supervision. A strip of ten yards will be left unburnt around each shola.	648 to 657
Closure of unauthorized burnt areas.—All areas where there had been unauthorized burning will be closed for a specified period in accordance with the standing orders.	658
Other regulations.—No penning licences are required for occupation of Toda cattle in Toda munds in Toda patta land	659
All areas closed for grazing will be demarcated by suitable sign boards	660

CHAPTER X—THE MINOR FOREST PRODUCE WORKING CIRCLE.

Constitution of the Working circle.—The working circle extends over all the reserves and the unreserves of the Nilgiris district	662
Analysis of the crop.—The principal items of minor forest produce are honey, wax, tamarind, deer and Sambhur horns, *Cassia auriculata* bark, *Cassia fistula* bark, stone and tree mass, *Gaultheria frangrantissima*, *Sapindus emarginatus*, marking nuts, neem and pungam seeds, date leaves, and Korai grass. There are many medicinal shrubs not exploited on a commercial scale	663
Method of exploitation.—Deer and Sambhur horns will be collected departmentally	664
All other minor forest produce will be exploited through the agency of contractors by annual leases	665
There will be three units of lease, one for each taluk of the district. The annual lease will commence from the 1st of July	666 and 667
Bamboos occurring scattered in Mudumalai and Sigur Ranges will be included as an item of Minor Forest Produce in the Gudalur and Ootacamund taluk leases. Bamboos will not be an item of minor forest produce in the Coonoor taluk lease as they are covered by the Bamboo Working Circle	668
Cassia fistula will be exploited on a rotation of five years and hence will be included as an item of minor forest produce in the leases only once in five years.	669

CHAPTER XI—MISCELLANEOUS REGULATIONS.

Hardwood Eucalyptus plantations.—For arboretal and historical interest as well as for research purposes 24 acres of 6 different species of Hardwood Eucalyptus is maintained in Aramby Block VI	671
Details of the species and area occupied by them given	672
The areas include silviculturists sample plots	673
Thinnings in the areas retained are prescribed so as to develop them into a high forest	674
A small plot of *Eucalyptus maculata* is maintained in Cairnhill Block III-2	675
Fire protection.—The nature of fires that occur in the division and the fire protection measures to be taken are indicated	676 to 680

CHAPTER XI—MISCELLANEOUS REGULATIONS—*cont.*

	PARAGRAPH
The block and campartment lines are to be kept constantly cleared	681
All plantations will have a scraped line of 9 feet round their periphery	682
Details of firelines to be maintained and the mode of maintenance are given for each range. Provision for employment of fire patrols during the fire season is also made	683 to 700
Fire maps will be maintained separately for each range	701
Roads.—All the roads, cart tracks and paths will be kept in good repair	702 and 703
The gradual improvement of main roads for fast traffic is suggested	..
Improvement of Benne-Mukkatti Road for motor traffic is indicated	704
Buildings.—All departmental buildings will be kept in good repair. The surroundings will be kept clean spraying periodically the quarters in malarial tracts with anti-malarial extracts is prescribed	705
Improvements to the Kargudy colony and the rest house by electrifying the buildings are suggested	706
A scavenger to the Kargudy colony and improvement of the sanitary conditions as well as water supplies are necessary	707 and 708
Improvements to Masinagudi subordinate quarters are suggested	709
Construction of quarters for two foresters and seven forest guards and watchers in Mudumalai and Sigur ranges suggested	710 and 711
Purchase of a suitable building for the District Forest Officer at Ootacamund is suggested	712
In Bishop Down Colony quarters for 4 clerks are suggested	713
Lascelles plantation.—Planting of ornamental trees on the periphery of the Lascelles plantation is prescribed as it is a conspicuous place in the Downs	714 and 715
Conversion of plantations of conifers and other exotics.—Miscellaneous plantations of no economic value will be converted into bluegum at the rate of 10 acres per year. The Mahogany plantation near Burliyar will be maintained and the natural regeneration made to spread.	718 to 720
Badaga fuel permit system.—In order to gradually bring to an end the pernicious Badaga Fuel Permit system, village plantations will be created either through co-operative effort or departmentally in specified areas and the produce available only to the population in the vicinity and not for transport to the big consuming centres	721 to 725
Miscellaneous bluegum and wattle plantations.—The small and scattered wattle areas not included in the Wattle Working Circle will be converted into bluegum. The blue gum areas not included in the Bluegum Working Circle will be worked within the framework of the plan for the Bluegum Working Circle. The converted bluegum areas and the scattered bluegum plantations not included in the Bluegum Working Circle will be amalgamated with the Bluegum Working Circle during the next revision	726 and 727
Livestock.—Thirteen departmental elephants will normally be required for dragging timber, etc., and two old ones for the joy rides of the visitors to the Sanctuary on payment of the specified hire charges	728
Elephant capturing operations will be continued under the management of the Mudumalai Range Officer	729
Two bullocks will be maintained for the water cart at Kargudy until an improved method of water-supply is adopted	730
Firewood supply to Masinagudy.—To meet the local firewood demand at Masinagudy, ten acres will be felled annually. The regrowth by coppice will be supplemented by artificial regeneration of useful fuel and fodder species at an espacement of 33 feet by 33 feet	731 to 733
Boundaries.—Maintenance of boundaries, disreservation of tiny reserves and reservation of suitable lands adjoining campact blocks of reserves are suggested. Afforestation experiments with teak, balsa, aini and evodia are suggested in the Cherambadi and Cherangode forests after reservation	734 to 737
Cultivation of willows.—*Salyx babylonica* cuttings will be planted in swampy patches in the Downs at the rate of ten acres per year	738
Game sanctuary at Mudumalai.—Details of the Sanctuary and measures for having effective protection against poachers shooting from motor vehicles are indicated ..	739 to 742

CHAPTER XI—MISCELLANEOUS REGULATIONS—*cont.*

PARAGRAPH

Afforestation of the Wenlock Downs and the Kundahs.—In accordance with the orders of the Chief Conservator of Forests, an annual planting of 300 acres in Wenlock Downs with blue gum and 200 acres with wattle near Kokothorai (the Kundahs) will be done in addition to the prescriptions contained in the Bluegum and the Wattle Working Circles of this plan on receipt of sanction .. .. 743 to 749

Control.—Details regarding the maintenance of Control Forms, Record of works and the Control Journal given .. .. 750 and 751

CHAPTER XII—ESTABLISHMENT AND LABOUR.

Establishment.—Additional staff required are one clerk, five foresters, nine plantation watchers and one scavenger .. .. 752 to 755

Labour.—There is difficulty in procuring labour. Construction of labour lines near wattle afforestation areas is necessary. Leasing out half an acre of land for each family is suggested for attracting the labour and for inducing them to settle in the area. In order to increase the effective working hours of the labour employed locally, the purchase of a motor lorry is suggested .. .. 756 to 759

CHAPTER XIII—FINANCIAL FORECAST AND COST OF THE WORKING PLAN.

Forecast.—An annual surplus of about two lakhs of rupees in the first five years and about 3½ lakhs of rupees in the succeeding five years is anticipated. .. .. 760 and 761

Cost of the working plan.—The cost of the working plan is Rs. 79,524–5–6 including the share of direction charges of the Conservator of Forests, Working Plans Circle, and his office. One Working Plan Officer, two rangers, seven foresters, one clerk and four peons were employed for the Nilgiris Working Plan Division, which was formed on 28th August 1951 and closed on 1st July 1953 .. .. 762 to 764

APPENDIX I.

The mean, the mean maximum and the mean minimum temperatures recorded in Ootacamund and Wellington lying in the Nilgiris Plateau.

Temperatures in degrees Fahrenheit.

Months.	Ootacamund (Altitude 7,252 feet).			Wellington (Altitude 6,200 feet).		
	Mean.	Mean maximum.	Mean minimum.	Mean.	Mean maximum.	Mean minimum.
January	54	65	43	55	66	45
February	55	67	44	58	70	46
March	58	69	48	63	74	53
April	61	71	52	65	76	56
May	61	70	53	66	76	59
June	58	64	52	63	72	58
July	57	62	52	63	71	58
August	57	63	52	62	71	57
September	57	64	51	62	71	56
October	57	64	51	61	68	55
November	55	63	48	58	66	53
December	54	64	44	56	65	48
Mean Annual Extremes ..	..	77	25	..	80	37

APPENDIX II.

Statement showing the monthly rainfall recorded at some of the important stations in the Nilgiris Division.

Name of the rain guage stations.	*January.*	*February.*	*March.*	*April.*	*May.*	*June.*	*July.*	*August.*	*September.*	*October.*	*November.*	*December.*	*Total for a year.*	*Average for the period.*
Ootacamund	0·9	0·5	1·1	3·3	6·1	6·4	7·5	5·4	5·1	8·0	5·1	1·9	51·3	1940–50.
	(2)	(1)	(2)	(7)	(11)	(13)	(14)	(12)	(11)	(14)	(9)	(4)	(100)	
Nanjanad Farm	0·9	0·6	1·4	4·3	5·0	7·2	10·2	7·0	5·5	6·9	5·3	1·3	55·6	1936–51.
Mukurti Ridge Top	1·3	·1	·6	2·0	25·0	87·9	78·1	53·4	37·2	18·9	2·1	1·6	308·8	1933–34.
Glenmorgan	0·4	0·3	1·2	3·6	7·6	9·1	18·0	14·2	6·5	8·8	7·1	1·6	78·1	1940–50.
	(1)	(1)	(2)	(6)	(12)	(17)	(23)	(21)	(14)	(13)	(8)	(2)	(120)	
Kundah Bridge	1·8	1·7	2·0	3·1	4·2	4·6	6·3	4·0	4·3	10·9	8·3	4·0	55·2	1940–50
	(3)	(2)	(3)	(6)	(8)	(10)	(12)	(10)	(10)	(15)	(12)	(6)	(97)	
Coonoor	2·5	2·9	3·2	5·9	4·2	2·8	2·6	5·0	3·6	10·1	11·2	5·6	59·4	1940–50.
	(3)	(3)	(3)	(7)	(8)	(6)	(7)	(9)	(7)	(14)	(13)	(7)	(87)	
Sim's Park	3·5	3·2	3·7	6·3	4·0	3·2	3·3	4·3	4·2	9·9	12·9	5·3	63·8	1936–51.
Kotagiri	2·7	2·3	2·2	4·7	6·3	4·3	4·7	4·5	6·1	14·3	10·0	4·4	66·5	1940–51.
	(3)	(3)	(3)	(7)	(10)	(10)	(10)	(9)	(10)	(16)	(12)	(7)	(100)	
Ketti	1·5	1·0	1·6	3·5	5·4	4·7	5·1	4·9	5·9	9·1	6·1	2·6	51·4	1940–50.
	(2)	(2)	(2)	(7)	(10)	(10)	(11)	(9)	(10)	(14)	(10)	(4)	(91)	
Kodanad	1·8	1·2	1·1	3·2	6·6	3·5	4·5	4·4	6·5	12·0	9·0	4·1	57·9	1940–50.
	(3)	(2)	(2)	(5)	(9)	(8)	(11)	(10)	(10)	(15)	(11)	(5)	(91)	
Bandishola	2·9	3·0	2·3	5·9	4·7	3·6	4·6	5·7	4·8	10.8	12·7	4·2	65·2	1937–49.
Rallia	1·9	·6	1·9	4·7	5·0	2·9	2·5	6·4	4·7	10·8	13·1	5·2	59·7	1944–48.
Billikal	1·0	·4	·7	3·6	7·2	3·5	4·6	4·9	4·8	9·1	7·1	1·8	48·7	1940–50.
	(2)	(1)	(2)	(7)	(11)	(8)	(11)	(10)	(9)	(13)	(10)	(3)	(87)	
Masinagudi	·6	·3	·6	3·5	3·3	3·3	4·4	4·5	2·8	6·5	5·4	1·3	36·5	1937–50.
Singara H. E. Camp	·1	1·5	·3	1·8	4·2	3·3	14·0	4·0	4·5	3·9	4·1	·1	41·8	1950–51.
Anaikatti	·6	·2	·3	2·2	3·6	1·7	2·5	2·7	3·3	6·7	5·9	·1	29·8	1937–50.
Moyar H. E. Camp	0·0	·3	·3	2·7	3·6	1·9	4·3	3·1	1·5	5·4	2·1	·1	25·3	1948–51.
	(0)	(2)	(1)	(10)	(10)	(11)	(17)	(15)	(10)	(16)	(9)	(1)	(102)	
Kargudi	0·6	0·4	0·5	2·8	4·0	7·2	13·0	8·9	5·1	6·0	4·8	0·9	54·2	1937–50.
	(1)	(1)	(1)	(7)	(7)	(13)	(20)	(16)	(12)	(10)	(6)	(2)	(96)	
Mudumalai	0·1	0·3	0·6	2·9	4·4	8·2	12·0	9·6	5·2	6·1	4·9	0·7	55·0	1937–49.
	(1)	(1)	(1)	(7)	(8)	(14)	(18)	(19)	(14)	(12)	(8)	(3)	(106)	
Benne	0·2	0·1	0·5	2·1	7·8	11·4	14·7	11·8	5·9	10·2	3·7	0·7	69·1	1930–35.
Devarshola Estate	0·5	0·3	0·7	3·7	5·3	18·4	24·0	14·3	8·2	8·0	4·1	0·6	88·1	1936–51.
	(1)	(1)	(2)	(9)	(12)	(26)	(28)	(25)	(19)	(14)	(9)	(2)		
Mango Range Estate	0·5	0·2	1·1	3·5	5·9	45·2	25·7	13·8	11·0	9·7	4·7	1·2	122·5	1936–51.
Devala	0·3	0·2	0·7	2·9	6·9	30·7	46·0	33·1	19·0	12·0	4·8	1·3	157·9	1940–50.
	(1)	(1)	(1)	(5)	(10)	(25)	(28)	(25)	(20)	(14)	(6)	(2)	(138)	
Gudalur	0·4	0·3	0·7	2·8	5·2	16·3	29·0	17·5	8·0	6·9	3·2	0·7	91·0	1940–50.
	(1)	(1)	(2)	(6)	(8)	(19)	(25)	(21)	(15)	(12)	(6)	(2)	(118)	
Naduvattam	0·5	0·3	0·8	3·2	6·0	17·9	31·6	19·0	8·7	8·4	4·2	1·0	101·6	1940–50.
	(1)	(1)	(2)	(7)	(10)	(20)	(25)	(22)	(16)	(13)	(7)	(2)	(126)	

NOTE.—Wherever available, the number of rainy days in the month is indicated within brackets below the average rainfall figures.

APPENDIX III.

List of Reserved Forests in the Nilgiris Division, Ootacamund North Range.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in Fort St. George Gazette.* (5)
		Ootacamund North Range.		
1 Aramby	423·46-4/8	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 143, dated 19th May 1885.	Page 348.
2 Aramby Addition I ..	64·18	G.O. Mis. No. 1234, Revenue (Special), dated 6th July 1920.	No. 224, dated 6th July 1920.	Page 908, dated 6th July 1920.
3 Aramby Addition II ..	31·38–11/16	....	No. 619, dated 11th September 1945.	....
4 Attikallu	48·73	G.O. No. 737, Revenue, dated 23rd July 1900, embodied in B.P. F. No. 339, dated 14th August 1900.	No. 347, dated 23rd July 1900.	Page 1166, dated 31st July 1900.
5 Adichathada shola ..	17·91	G.O. No. 1189, Revenue, dated 26th December 1901, embodied in B.P.F. No. 24, dated 18th January 1902.	No. 3, dated 7th January 1902.	Page 11, dated 7th January 1902.
6 Baikie	161·92	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 281, dated 21st September 1885.	Page 680, dated 9th October 1885.
7 Baikie Addition	14·08	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856 F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Do.
8 Bracken shola	88·82	G.O. No. 192, Development, dated 12th January 1950.	....	....
9 Brooklands (Todanad).	114·37	G.O. No. 332, Revenue, embodied in B.P. No. 1020-F-189, dated 27th March 1885.	No. 84, dated 14th March 1885.	Page 214, dated 24th March 1885.
10 Billikal road	24·93	G.O. No. 476, Revenue, dated 29th May 1891, B.P. No. 303, dated 11th July 1891.	No. 253, dated 9th June 1891.	Page 510, dated 9th June 1891.
11 Bikkapathimund ..	1,827·64	G.O. No. 518, Revenue, dated 18th July 1894, B.P. No. 528, dated 9th August 1894.	No. 368, dated 18th July 1894.	....
12 Bettumund North ..	119·47	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 768-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 195, dated 17th March 1896.
13 Carriott shola	223·49	G.O. No. 188, dated 13th March 1886, embodied in B.P. No. 786-F-152, dated 30th March 1886.	No. 89, dated 5th March 1886.	Pages 195 to 197, dated 17th March 1886.
14 Carritt shola addition I.	54·82	G.O. No. 531, Revenue, dated 17th September 1898, embodied in B.P. (L.R.) F. No. 447, dated 13th October 1898.	No. 438, dated 17th September 1898.	Page 907, dated 17th September 1898.
15 Do. II.	22·88			
16 Do. III.	13·01			
17 Do. IV.	47·25			
18 Do. V.	46·99			
19 Do. VI.	5·25			
20 Craigmore	299·41-7/8	G.O. No. 478, Revenue, dated 28th April 1885, communicated with B.P. No. 1473-F-273, dated 18th May 1885.	No. 141, dated 28th April 1885.	Page 343, dated 19th May 1885.
21 Cully Reserve	71·11	G.O. No. 1407, Revenue, dated 18th December 1884, embodied, in B.P. No. 86-F-16, dated 14th January 1885.	No. 143, dated 28th April 1885.	Page 349, dated 19th May 1885.
22 Dodabetta Block I ..	294·49-6/8	G.O. No. 478, Revenue dated 28th April 1885, communicated with B.P. No. 1473-F-273, dated 18th May 1885. September 1885, embodied in B.P. No. 2856-F-564, dated 13th October 1885.	No. 141, dated 28th May 1885. No. 281, dated 21st September 1885.	Page 344, dated 19th May 1885. Page 679, dated 9th October 1885.
23 Dodabetta Block Addition I.	17·00-2/8	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856 F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 679 dated 9th October 1885.
24 Do. II.	17·00-2/8	G.O. No. 681, Revenue, dated 6th August 1901, B.P. F. No. 293, dated 27th August 1901.	No. 355, dated 13th August 1901.	Page 1420.
25 Dodabetta Reserve Block II.	449·54-5/8	G.O. No. 694, Revenue, dated 11th August 1886, embodied in B.P. No. 470, dated 6th September 1886.	No. 307, dated 11th August 1886.	Page 715, dated 13th August 1886.
26 Dodabetta Reserve Block Addition I.	8·20	G.O. No. 476, Revenue, dated 29th May 1891, B.P. (L.R.) for 303, dated 11th July 1891.	No. 253, dated 9th June 1891.	Page 510, dated 9th June 1891.
27 Do. II.	1·45	Do.	Do.	Do.
28 Do. III.	3·15	Do.	Do.	Do.
29 Doda shola I	10·24	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856-F-584, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 679, dated 9th October 1885.
30 Doda shola Addition ..	10·26	G.O. No. 476, Revenue, dated 29th May 1891, embodied in B.P. No. 303, Forest, dated 11th July 1891.	No. 253, dated 9th June 1891.	Page 510, dated 9th June 1891.
31 Doda shola Addition II.	12·88	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856-F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 679, dated 9th October 1885.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in* **Fort St. George Gazette.** (5)
		Ootacamund North Range—cont.		
32 Dodashola Sholur village.	16·02	G.O. No. 1270, Revenue, dated 26th December 1900, embodied in B.P.F. No. 28, dated 12th January 1901.	No. 11, dated 8th January 1901.	Page 27, dated **8th January 1901.**
33 Devamalai	229·00	G.O. No. 367, Revenue (Forest), No. 104, dated 27th May 1890, B.P. F. No. 374, dated 26th June 1890.	No. 213, dated 27th May 1890.	Page 372, dated **3rd** June 1890.
34 Ebbanad	570·88	G.O. No. 697, Revenue, embodied in B.P. No. 489, dated 14th September 1886.	No. 325, dated 11th August 1886.	Page 1040, dated **4th** September 1894.
35 Ebbanad Addition ..	219·00	G.O. No. 630, Revenue Forest No. 240, dated 30th August 1894, B.P. No. 597 (L.R.), Forest, dated 15th September 1894.	No. 432, dated 4th September 1894.	Page 1040, dated **4th** September 1894.
36 Governor shola ..	33·21	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 143, dated 28th April 1885.	Page 349, dated **19th** May 1885.
37 Honnatholai, North ..	320·33	G.O. No. 188, Revenue, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 194, dated **17th** March 1886.
38 Honnatholai, North Addition I.	11·80	G.O. No. 2888, Revenue, embodied in B.P. F. No. 244, dated 7th December 1907.	No. 556, dated 23rd November 1907.	Page 1184, dated **26th** November 1907.
39 Honnatholai, North Addition II.	13·00	Do.	Do.	Do.
40 Honnatholai, North Addition III.	13·06	Do.	Do.	Do.
41 Honnatholai	52·01	Do.	Do.	Do.
42 Jakuntha	400 56	G.O. No. 318, Revenue, dated 5th May 1886, embodied in B.P. No. 288, Forest, dated 26th May 1886.	No. 165, dated 8th May 1886.	Page 441, dated **12th** May 1886.
43 Karpakam	453·32	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 5th March 1886.	Page 195, dated **17th** March 1886.
44 Kengodu, North ..	451·20	Do.	Do.	Do.
45 Kotagiri Trace shola ..	19·70	G.O. No. 478, Revenue, dated 28th April 1885, communicated with B.P. No. 1473-F-273, dated 18th May 1885.	No. 141, dated 28th April 1885.	Page 345, dated **19th** May 1885.
46 Kotagiri Trace shola II.	31·62	Do.	Do.	Do.
47 Krurmund, North .. } **48** Krurmund, South .. }	1,552·05	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 143, dated 28th April 1885.	Page 349, dated **19th** May 1885.
49 Keradamund	216·19	G.O. No. 145, Revenue, F. No. 24, dated 13th February 1892, B.P. (L.R.) Forest No. 106, dated 8th March 1892.	No. 66, dated 13th February 1892.	Pages 184 to 185, dated 16th February **1892.**
50 Kunnur	14·19	G.O. No. 457, Revenue, F. No. 181, dated 29th June 1894, B.P. (L.R.) Forest No. 473, dated 27th July 1894.	No. 343, dated 29th June 1894.	Page 843, dated **10th** July 1894.
51 Kengal	14·33	G.O. No. 408, Revenue, dated 9th June 1894, B.P. (L.R.) Forest No. 424, dated 28th June 1894.	No. 279, dated 9th June 1894.	....
52A Kalhatti road I ..	6·63	G.O. No. 358, Revenue, dated 20th April 1900, embodied in Forest No. 71, B.P. F. No. 185, dated 10th May 1900.	No. 182, dated 20th April 1900.	....
52B Kalhatti road II ..	4·08	Do.	Do.	....
53 Kodappamund ..	74·54	Do.	Do.	....
54 Kulkal valley	263·80	G.O. No. 296, Revenue, dated 18th March 1903, embodied in B.P. No. 97, dated 3rd April 1903.	No. 118, dated 24th March 1903.	Page 368.
55 Kambatti block ..	736·03	G.O. No. 301, Revenue, dated 29th March 1906, embodied in B.P. No. 97, dated 23rd April 1906.	No. 166, dated 3rd April 1906.	Page 396.
56 Mainalai	115·03	G.O. No. 1075, dated 21st September 1885, embodied in B.P. No. 2856-F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 679, dated **9th** October 1885.
57 Mudidevarmund	162·70	G.O. No. 816, Revenue, dated 11th August 1900, B.P.F. No. 372, dated 5th September 1900.	No. 366, dated 11th August 1900.	....
58 Madana	30·60	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856-F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 680, dated **9th** October 1885.
59 Marlimund shola ..	74·89	G.O. No. 322, Revenue, embodied in B.P. No. 1020-F-189, dated 27th March 1885.	No. 88, dated 14th March 1885.	Page 217, dated **24th** March 1885.
60 Marlimund shola Addition.	25·20-6/8	G.O. No. 2888, Revenue, embodied in B.P. F. No. 244, dated 7th December 1907.	No. 566, dated 23rd November 1907.	Page 1184, dated **26th** November 1907.
61 Malimund Plantation ..	15·58-4/8	G.O. No. 1321, Revenue, dated 1st December 1884, embodied in B.P. No. 4726-F-446, dated 12th December 1884, also C. No. 360-B.	No. 231, dated 1st December 1884.	Page 794, dated **9th** December 1884.
62 Muthanad	303·67	G.O. No. 322, Revenue, embodied in B.P. No. 1020-F-189, dated 27th March 1885.	No. 84, dated 14th March 1885.	Page 214, dated **24th** March 1885.
63 Mukurti Lake R.F. (Part).	1,476·55	G.O. No. 305, dated 28th January 1944.	....	....

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in* **Fort St. George Gazette.** (5)
		Ootacamund North Range—cont.		
64 Naduvattam	3,507·93	G.O. No. 693, dated 16th July 1887, embodied in B.P. F. No. 459, dated 12th August 1887.	No. 277, dated 26th July 1887.	Page 592.
65 Naduvattam shola I ..	65·56	G.O. No. 188, Revenue, embodied in B.P. No. 769-F-152, dated 30th March 1885.	No. 88, dated 13th March 1886.	Page 197, dated 17th March 1886.
66 Naduvattam shola II ..	29·92	Do.	Do.	Do.
67 Nergodumund	55·20	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856-F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 680, dated 9th October 1885.
68 Newman	70·47	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 195, dated 17th March 1886.
69 Ouchterlony	973·12	Do.	Do.	Page 197, dated 17th March 1886.
70 Pykara North	844·00	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 143, dated 28th April 1885.	Page 349, dated 19th May 1885.
71 Pakulamand	76·09	G.O. No. 816, Revenue, dated 11th August 1900, embodied in B.P.F. No. 372, dated 5th September 1900.	No. 366, dated 11th August 1900.	....
72 Sandynullah Block I ..	706·04	G.O. No. 188, Revenue, embodied in B.F. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 195, dated 17th March 1886.
73 Sandynullah Block II ..	132·12	G.O. No. 330, Revenue, dated 26th April 1901, embodied in B.P. Forest No. 206, dated 3rd June 1901.	No. 198, dated 30th April 1901.	Page 762.
74 Snowdon	991·66-1/8	G.O. No. 478, Revenue, dated 28th April 1885, communicated with B.P. No. 1473-F-273, dated 18th May 1885.	No. 141, dated 28th April 1885.	Page 347, dated 19th May 1885.
75 Snowdon Addition I ..	18·30	G.O. No. 3419, Revenue, communicated with B.P. Forest No. 301, dated 1st December 1911.	No. 532, dated 15th November 1911.	Page 1140, dated 28th November 1911.
76 Snowdon Addition II..	5·17	G.O. No. 2116, Revenue, dated 17th September 1915, embodied in B.P.F. No. 139, dated 2nd October 1915.	No. 437, dated 17th September 1915.	Page 958, dated 5th October 1915.
77 Tharmatope	64·34	G.O. No. 322, Revenue, embodied in B.P. No. 1020-F-189, dated 27th March 1885.	No. 88, dated 14th March 1885.	Page 216, dated 4th March 1885.
78 Ulnad Reserve, North and South.	838·61	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 143, dated 28th April 1885.	Page 349, dated 19th May 1885.
79 Vellingiri	643·36	G.O. No. 188, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 5th March 1886.	Pages 195 and 197, dated 17th March 1886.
80 Vokkan shola	24·59	G.O. No. 816, Revenue, dated 11th August 1900, embodied in B.P. F. No. 372, dated 5th September 1900.	No. 366, dated 11th August 1900.	....
81 Woodcock shola I ..	5·32	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856-F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 679, dated 9th October 1885.
82 Woodcock shola II ..	11·20	Do.	Do.	Do.
83 Woodcock shola III ..	7·93	Do.	Do.	Do.
84 Wenlock Downs ..	14,689·48¾	G.O. No. 295, Revenue, dated 26th March 1900, B.P. (L.R.), Forest No. 149, dated 18th April 1900.	No. 144, dated 27th March 1900.	Pages 473 and 474, dated 27th March 1900.
85 Wenlock Downs Addition I.	0·50	G.O. Ms. No. 1446, dated 5th October 1923.	No. 263, dated 20th September 1923.	Page 1080, dated 25th September 1923.
86 Yemmaikal	464·64	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Pages 195 and 197, dated 17th March 1886.
	36,756·69-1/16			
		Ootacamund South Range.		
1 Araihatti	50·84	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
2 Attuboil	6·57	Do.	Do.	Do.
3 Attuboil Addition I ..	10·61	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P.F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
4 Attuboil Addition II ...	54·30	G.O. No. 150, dated 27th February 1901, embodied in B.P.F. No. 114, dated 21st March 1901.	No. 120, dated 19th March 1901.	Pages 387 to 389.
5 Aduvamara ..	25·14	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P.F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
6 Attimara	11·25	G.O. No. 353, Revenue, dated 1st May 1901, embodied in B.P. F. No. 200, dated 1st June 1901.	No. 221, dated 7th May 1901.	Pages 798 and 799.

Serial number and name of reserved forest.	*Area in acres.*	*Reference to authority communicating section 16 notification.*	*Section 16 notification number and date.*	*Page in* Fort St. George Gazette.
(1)	(2)	(3)	(4)	(5)
		Ootacamund South Range—cont.		
7 Billimara	5·92	....	....	....
8 Bathri shola	33·97	G.O. No. 322, Revenue, embodied in B.P. No. 1020-F-189, dated 27th March 1885.	No. 88, dated 14th March 1885.	Page 216, dated 24th March 1885.
9 Begulihalla	33·74	G.O. No. 53, Revenue, dated 15th January 1892, B.P. No. 90, dated 25th February 1892.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
10 Bikkul	7·15	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
11 Bethal	5·64	Do.	Do.	Do.
12 Bethal Addition ..	59·60	G.O. No. 150, Revenue, dated 27th February 1901, embodied in B.P. F. No. 114, dated 21st March 1901.	No. 129, dated 19th March 1901.	Pages 387 to 389.
13 Bullihattihalla	18·26	G.O. No. 667, dated 25th November 1896, embodied in B.P. F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
14 Belarambuhalla ..	137·72	G.O. No. 672, Revenue, dated 14th November 1898, embodied in B.P. F. No. 552, dated 5th December 1898.	No. 525, dated 5th November 1898.	Page 1111, dated 15th November 1898.
15 Birgundu ..	14·67	G.O. No. 150, Revenue, dated 27th February 1901, embodied in B.P. F. No. 114, dated 21st March 1901.	No. 129, dated 19th March 1901.	Pages 387 to 389.
16 Billikottu	1·94	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P. F. No. 475, dated 26th November 1900.	No. 483, dated 30th October 1900.	Page 1585, dated 6th November 1900.
17 Cairn Hill	404·20-5/8	G.O. No. 1321, Revenue, dated 1st December 1884, embodied in B.P. No. 4276-F-446, dated 12th December 1884.	No. 231, dated 1st December 1884.	Page 794, dated 9th December 1884.
18 Cairn Hill Addition ..	0·74⅛	G.O. No. 266, Revenue, dated 14th March 1902, embodied in B.P. No. 110, dated 26th March 1902.	No. 128, dated 18th March 1902.	Page 297.
19 Devashola, North ..	101·45	G.O. No. 224, Revenue, embodied in B.P. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.
20 Devashola, South ..	94·16	Do.	Do.	Do.
21 Devashola Addition I ..	22·68	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P. F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
22 Elkhill	77·34⅛	G.O. No. 478, Revenue, dated 28th April 1885, communicated with B.P. No. 1473-F-273, dated 18th May 1885.	No. 141, dated 28th April 1885.	Page 344, dated 19th May 1885.
23 Fernhill shola	10·38	G.O. No. 476, Revenue, dated 29th May 1891, embodied in B.P. F. No. 303, Forest, dated 11th July 1891.	No. 253, dated 9th June 1891.	Page 510, dated 9th June 1891.
24 Fairlawns Block I ..	60·27	G.O. No. 1075, Revenue, dated 21st September 1885, embodied in B.P. No. 2856-F-564, dated 13th October 1885.	No. 281, dated 21st September 1885.	Page 680, dated 9th October 1885.
25 Fairlawns Block II ..	22·25	Do.	Do.	Do.
26 Fairlawns Addition Block I.	21·98	G.O. No. 476, Revenue, dated 29th May 1891, embodied in B.P. No. 303, dated 11th July 1891.	No. 253, dated 9th June 1891.	Page 510, dated 9th June 1891.
27 Girigehada I	8·57	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P. F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
28 Girigehada II	49·10	G.O. No. 150, dated 27th February 1901, embodied in B.P.F. No. 114, dated 21st March 1901.	No. 129, dated 19th March 1901.	Pages 387 to 389.
29 Hiriashege	2,145·04	G.O. No. 978, Revenue, dated 12th November 1886, embodied in B.P. F. No. 667, dated 10th December 1886.	No. 430, dated 12th November 1886.	Page 1063, dated 30th November 1886.
30 Hiriashege Addition ..	804·91	G.O. No. 355, Revenue, dated 21st May 1894, Forest No. 136, B.P. F. No. 374, dated 11th June 1894.	No. 258, dated 21st May 1894.	Page 650, dated 29th May 1894.
31 Hukku reserve	51·98	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P. F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1063, dated 30th November 1896.
32 Ithalar	225·46	G.O. No. 224, Revenue, embodied in B.P. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 388, dated 7th April 1886.
33 Ithalar Addition ..	12·06	....	No. 481, dated 10th September 1895.	Page 1024, dated 10th September 1895.
34 Iruporai	8·47	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P. F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
35 Kudishola I	8·58	G.O. No. 1177, Revenue, dated 23rd November 1900, embodied in B.P. F. No. 2, dated 7th January 1901.	No. 526, dated 11th December 1900.	Page 1728.
36 Kudishola III ..	26·32	G.O. No. 113, Revenue, dated 6th February 1903, embodied in B.P. F. No. 58, dated 26th February 1903.	No. 67, dated 10th February 1903.	Page 197.
37 Kadacoopa	1,622·24	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 5th March 1886.	Page 195, dated 17th March 1886.
38 Kothibennu	338·95	G.O. No. 224, Revenue, embodied in B.P. F. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in Fort St. George Gazette.* (5)
		Ootacamund South Range—cont.		
39 Kundah	37,807·98	G.O. No. 978, Revenue, dated 12th November 1886, embodied in B.P.F. No. 667, dated 10th December 1886.	No. 430, dated 12th November 1886.	Pages 1061 and 1062, dated 30th November 1886.
40 Kundah Addition I .. } 41 Kundah Addition III .. } 42 Kundah Addition IV .. }	1,062·00	G.O. No. 328, Revenue of No. 127, dated 9th May 1894, B.P. (L.R.), For., dated 2nd June 1894.	No. 239, dated 22nd May 1894.	Pages 581 to 583, dated 22nd May 1894.
43 Kundah Addition V ..	195·31	G.O. No. 148, Revenue, dated 16th February 1903, embodied in B.P.F. No. 86, dated 20th March 1903.	No. 94, dated 3rd March 1903.	Page 283.
44 Kallakorai	12·82	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
45 Keraipadu	50·09	G.O. No. 462, Revenue, dated 18th August 1898, embodied in B.P.F. No. 374, dated 3rd September 1898.	No. 386, dated 18th August 1898.	Page 793, dated 23rd August 1898.
46 Kotibettu	18·18	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P.F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
47 Kallakottu	17·47	Do.	Do.	Do.
48 Kokothorai	349·10	G.O. No. 2997, Revenue, dated 15th November 1909, communicated with B.P.F. No. 216, dated 26th November 1909.	No. 465, dated 5th Novemer 1909.	Pages 1222 and 1223, dated 23rd November 1909.
49 Lovedale East	102·04-5/16	G.O. No. 478, Revenue, dated 28th April 1885, communicated with B.P. No. 1473-F-273, dated 18th May 1885.	No. 141, dated 28th April 1885.	Page 346, dated 19th May 1885.
50 Lovedale West ..	65·14	Do.	Do.	Do.
51 Manjanakarai ..	12·21⅝	Do.	Do.	Do.
52 Maryland	79·37	G.O. No. 224, Revenue, embodied in B.P. No. F. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.
53 Melur West	16·40	Do.	Do.	Do.
54 Meekerubettu	1,267·00	G.O. No. 978, Revenue, dated 12th November 1886, embodied in B.P.F. No. 667, dated 10th December 1886.	No. 430, dated 12th November 1886.	Page 1063, dated 30th November 1886.
55 Meekerubettu Addition.	23·73	G.O. No. 96, Revenue (Special), dated 21st January 1919, embodied in B.P. F. Mis. No. 60, dated 21st January 1919.	No. 23, dated 21st January 1919.	Page 135, dated 21st January 1919.
56 A Mukurti Lake (Part).	1,736·95	....	....	....
B Mukurti peak ..	1,323·52	G.O. No. 188, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Pages 195 to 197, dated 17th March 1886.
57 Mullimalai	66·21	G.O. No. 462, Revenue, dated 18th August 1898, embodied in B.P.F. No. 374, dated 3rd September 1898.	No. 386, dated 18th August 1898.	Pages 793, dated 23rd August 1898.
58 Melkundah	19·92	G.O. No. 336, Revenue, dated 26th March 1903, embodied in B.P.F. No. 112, dated 17th April 1903.	No. 135, dated 31st March 1903.	Page 408, dated 31st March 1903.
59 Nilgiri peak	5,925·19	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Pages 195 to 197, dated 17th March 1886.
60 Nilgiri peak Addition ..	28·85	....	....	....
61A Nanjanad reserve ..	914·39	G.O. No. 426, Revenue, dated 15th April 1893 and B.P. (L.R.) For. No. 446, dated 12th June 1893.	No. 272, dated 15th May 1892.	....
61B Do. Addition ..				
62 Nirkal	7·63	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
63 Pichalbettu	1,667·84	Do.	Do.	Pages 195 to 197, dated 17th March 1886.
64 Puthuhatti	25·91	G.O. No. 224, Revenue, embodied in B.P.F. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.
65 Porthimund	6,983·18	G.O. No. 350, Revenue, dated 19th May 1894, For. No. 133 and B.P.F. No. 385, dated 14th June 1894.	No. 253, dated 19th May 1894.	Do.
66 Pullukkorai	4·09	....	....	....
67 Red Hills No. II ..	47·83	....	No. 30, dated 15th January 1892.	....
68 Red Hills No. I ..	222·00	G.O. No. 330, Revenue, dated 26th April 1901, embodied in B.P. No. 206, dated 3rd June 1901.	No. 198, dated 30th April 1901.	Page 762.
69 Sillahalla	200·90	G. O. No. 224, Revenue, embodoied in B.P.F. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.
70 Terrace No. I	20·82	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 197, dated 17th March 1886.
71 Do. No. II ..	54·93	Do.	Do.	Do.
72 Thalakad	182·09	G.O. No. 224, Revenue, embodied in B.P. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.
73 Thiashola	1,534·19	G.O. No. 978, Revenue, dated 12th November 1886, embodied in B.P.F. No. 667, dated 10th December 1886.	No. 430, lated 12th November 1886.	Pages 1061 and 1063, dated 30th November 1886.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in Fort St. George Gazette.* (5)
		Ootacamund South Range—cont.		
74 Turiyalla	12·85	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
75 Umarikandi	10·75	Do.	Do.	Do.
76 Ulimokkai	9·39	Do.	Do.	Do.
77 Umariyathi	2·87	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P.F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
78 Vaganathabettu ..	243·39	G.O. No. 224, Revenue, embodied in B. P. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.
79 Vummundu	19·33	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
80 Volibettu	15·47	Do.	Do.	Do.
81 Do. Addition ..	35·00	G.O. No. 353, Revenue, dated 1st May 1901, embodied in B.P.F. No. 200, dated 1st June 1901.	No. 221, dated 7th May 1901.	Pages 798 and 799.
82 Webeck I	5·69	G.O. No. 667, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
83 Do. II	28·48	Do.	Do.	Do.
84 Do. III	18·85	Do.	Do.	Do.
85 Woodcock shola ..	25·90	G.O. No. 148, Revenue, dated 16th February 1903, embodied in B.P.F. No. 86, dated 20th March 1903.	No. 94, dated 3rd March 1903.	Page 283.
85 (*a*) Wenlock Downs (Part).	4,600·00	G.O. No. 295, Revenue, dated 26th March 1900, B.P. (L.R.), (Forest) No. 149, dated 18th April 1900.	No. 144, dated 27th March 1900.	Pages 473 and 474, dated 27th March 1900.
86 Yedakad	116·53	....	No. 29, dated 15th January 1892.	....
87 Yettimara	2·60	G.O. No. 1094, Revenue, dated 30th October 1900, B.P. (L.R.) (Forest) No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
	73,792·82-13/16.			
		Coonoor Range.		
1 Athigarahatti	26·87	G.O. No. 224, Revenue, embodied in B.P.F. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 338, dated 7th April 1886.
2 Athigarahatti shola Addition No. I.	6·82	G.O. No. 1177, Revenue, dated 23rd November 1900, embodied in B.P.F. No. 2, dated 7th January 1901.	No. 526, dated 11th December 1900.	Page 1728.
3 Do. No. II ..	103·97	G.O. No. 353, Revenue, dated 1st May 1901, embodied in B.P.F. No. 200, dated 1st June 1901.	No. 221, dated 7th June 1901.	Pages 798 and 799.
4 Avaraihalla (Paranginad).	121·07	....	No. 248, dated 17th May 1900.	....
5 Araigodalu	1·23	G.O. No. 400, Revenue, dated 27th April 1900, B.P.F. No. 219, dated 25th May 1900.	No. 211, dated 27th April 1900.	....
6 Attukorai	2·20	G.O. No. 1094, dated 30th October 1900, embodied in B.P.F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900. ..	Page 1585, dated 6th November 1900.
7 Airlie	1·65	G.O. No. 112, Revenue, dated 6th February 1903, embodied in B.P.F. No. 57, dated 26th February 1903.	No. 71, dated 10th February 1903.	Page 162.
8 Attikadu shola ..	71·54	G.O. No. 648, Revenue, dated 29th June 1903, embodied in B.P.F. No. 201, dated 21st July 1903.	No. 281, dated 7th June 1903.	Page 726.
9 Do. Addition	44·27	G.O. Ms. No. 1757, Development (B.P. Department), dated 7th January 1925 (R. Dis. No. 1523 of 1924).	No. 361, dated 21st November 1925.	Pages 2304 and 2305, dated 1st December 1925.
10 Alagaruhanni ..	22·24	G.O. No. 683, Revenue, dated 6th July 1903, embodied in B.P.F. No. 205, dated 22nd July 1903.	No. 290, dated 14th July 1903.	Page 749.
11 Benhope No. I	37·72	G.O. No. 1050, Revenue, dated 15th September 1885, communicated with B.P. No. 2788-F-550, dated 3rd October 1885.	No. 276, dated 15th September 1885.	Page 647, dated 2nd October 1885.
12 Do. No. II ..	30·02	G.O. No. 374, Revenue, dated 27th April 1891, embodied in B.P.F. No. 281, dated 30th June 1891.	No. 206, dated 27th April 1891.	Page 382, dated 5th May 1891.
13 Bettumund, South ..	102·49	G.O. No. 349, R venue, dated 20th April 1891, embodied i B.P. No. 315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Page 350.
14 Brooklands (Paranginad).	14·36	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 144, dated 28th April 1885.	Page 351, dated 19th May 1885.
15 Billit uttu	34·72	G.O. No. 349, Revenue, dated 27th April 1891, embodied in B.P.F. No. 315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Do.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in Fort St. George Gazette.* (5)
		Coonoor Range—cont.		
16 Bettu No. I	23·52	G.O. No. 374, Revenue, dated 27th April 1891, embodied in B.P. (L.R.) F. No. 281, dated 30th June 1891.	No. 206, dated 27th April 1891.	Pages 382 and 385, dated 5th May 1891.
17 Bettu No. II	5·54	Do.	Do.	Do.
18 Bettu Addition No. II.	134·76	G.O. No. 997, Revenue, dated 30th September 1903, embodied in B.P.F. No. 273, dated 17th October 1903.	No. 403, dated 6th October 1903.	Page 1114.
19 Bikkihatti	18·91	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
20 Bellimara	5·98	G.O. No. 667, Revenue, dated 25th November 1896, B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
21 Bikkemalai	3·80	G.O. No. 400, dated 27th April 1900, embodied in B.P.F. No. 219, dated 25th May 1900.	No. 211, dated 27th April 1900.	—
22 Black Heath	9·75¼	G.O. No. 944, Revenue, dated 10th September 1900, Forest No. 185, B.P.F. No. 414, dated 5th October 1900.	No. 417, dated 10th September 1900.	....
23 Beggadu	56·92	G.O. No. 150, Revenue, dated 27th February 1901, embodied in B.P.F. No. 114, dated 21st March 1901.	No. 129, dated 19th March 1901.	Pages 387 to 389.
24 Beechworth	10·55	Do.	Do.	Do.
25 Banahada	4·83	G.O. No. 1156, Revenue, dated 12th December 1901, embodied in B.P.F. No. 8, dated 4th January 1902.	No. 483, dated 17th December 1901.	Page 2064.
26 Baraide	7·00	G.O. No. 186, Revenue, dated 21st February 1902, embodied in B.P.F. No. 84, dated 7th March 1902.	No. 89, dated 25th February 1902.	Page 216.
27 Burnside	5·59	G.O. No. 112, Revenue, dated 6th February 1903, embodied in B.P.F. No. 57, dated 26th February 1903.	No. 71, dated 10th February 1903.	Page 162.
28 Beragani	1,053·18	G.O. No. 681, Revenue, dated 29th June 1904, embodied in B.P.F. No. 143, dated 23rd July 1904.	No. 263, dated 5th July 1904.	Page 663.
29 Bettatti	7·97	G.O. No. 353, Revenue, dated 1st May 1901, embodied in B.P.F. No. 200, dated 1st June 1901.	No. 221, dated 7th May 1901.	Pages 798 and 799.
30 Bandyshola	110·87	G.O. No. 1321, Revenue, dated 1st December 1884, embodied in B.P. No. 4276,-F-446, dated 12th December 1884.	No. 231, dated 1st December 1884.	Page 795, dated 9th December 1884.
31 Black Bridge	390·30	Do.	Do.	Do.
32 Bleak House	51·59	G.O. No. 322, Revenue, embodied in B.P. No. 1020-F-189, dated 27th March 1885.	No. 88, dated 14th March 1885.	Page 217, dated 24th March 1885.
33 Burliyar	178·49	G.O. No. 1050, Revenue, dated 15th September 1885, embodied in B.P. No. 2788-F-550, dated 3rd October 1885.	No. 276, dated 15th September 1885.	Page 647, dated 2nd October 1885.
34 Coonoor Peak ..	274·02	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 144, dated 28th April 1885.	Page 350, dated 19th May 1885.
35 Commandu	272·73	G.O. No. 224, Revenue, embodied in B.P.F. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 339, dated 7th April 1886.
36 Clyffe	33·28	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1891.
37 Clyffe Addition No. I ..	58·63	G.O. No. 865, Revenue, dated 19th August 1903, embodied in B.P.F. No. 238, dated 3rd September 1903.	No. 342, dated 19th August 1903.	Page 931.
38 Curzon Valley No. I ..	138·38	G.O. No. 566, Revenue, dated 13th June 1900, Forest No. 120, B.P.F. No. 281, dated 4th July 1900.	No. 287, dated 13th June 1900.	....
39 Curzon Valley Addition No. II.	32·38	G.O. No. 479, Revenue, dated 17th May 1900, Forest No. 103 B.P.F. No. 246, dated 13th June 1900.	No. 250, dated 17th May 1900.	....
40 Do. No. III ..	917·37	G.O. No. 768, Revenue, dated 28th July 1903, embodied in B.P. No. 226, dated 20th August 1903.	No. 311, dated 28th July 1903.	Page 845, dated 4th August 1903.
41 Do. No. IV ..	222·60	G.O. No. 186, Revenue, dated 23rd February 1903, embodied in B.P. No. 84, dated 20th March 1903.	No. 91, dated 3rd March 1903.	Page 281.
42 Dodabetta No. I 43 Do. No. II (Parangina d). } ..	105·00	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
44 Dodabetta Addition ..	54·22	G.O. No. 467, Revenue, dated 7th May 1903, embodied in B.P. No. 152, Forest, dated 28th May 1903.	No. 196, dated 12th May 1903.	Page 548.
45 Dolphin	65·12	G.O. No. 349, Revenue, dated 20th April 1891, embodied in B.P.F. No. 315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Page 351.
46 Dolphin Addition ..	15·01	G.O. No. 1176, Revenue, dated 23rd November 1900, embodied in B.P.F. No. 5, dated 7th January 1901.	No. 525, dated 11th December 1900.	Page 1727.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in Fort St. George Gazette.* (5)
		Coonoor Range—cont.		
47 Deepdale	360·68	G.O. No. 374, Revenue, dated 27th April 1891, embodied in B.P. (L.R.)F. No. 281, dated 30th June 1891.	No. 206, dated 27th April 1891.	Page 383, dated 5th May 1891.
48 Dodakavu	62·41	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
49 Dodakavu Addition ..	56·68	G.O. Ms. No. 1715, Development, dated 17th December 1925, and C.C.'s Proceedings Mis. No. 325, dated 16th December 1925.	No. 361, dated 21st November 1925.	Pages 2304 and 2305, dated 1st December 1925.
50 Denad	2,072·35	G.O. No. 326, Revenue, dated 4th April 1892, Forest No. 57, B.P. (L.R.), For. No. 242, dated 20th May 1892.	No. 88, dated 13th March 1886.	Page 194, dated 17th March 1886.
51 Denad Addition No. I.	124·88	G.O. No. 205, Revenue, dated 6th March 1905, embodied in B.P.F. No. 80, dated 28th March 1905.	No. 85, dated 7th March 1905.	Page 206.
52 Do. No. II	43·37	G.O. No. 146, Revenue, dated 16th February 1903, embodied in B.P.F. No. 91, dated 24th March 1903.	No. 97, dated 3rd March 1903.	Page 285.
53 Do. No. III	75·82	G.O. No. 160, Revenue, dated 17th February 1903, embodied in B.P.F. No. 85, dated 20th March 1903.	No. 92, dated 3rd March 1903.	Page 282.
54 Doddani Reserve ..	5·03	G.O. No. 1177, Revenue, dated 23rd November 1900, embodied in B.P.F. No. 2, dated 7th January 1901.	No. 526, dated 11th December 1900.	Page 1728.
55 Edayath	7·20	G.O. No. 667, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
56 Edayath Addition No. I.	11·15	G.O. No. 150, dated 27th February 1901, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 129, dated 19th March 1901.	Pages 387 and 389.
57 Ghat reserve	201·93$\frac{3}{8}$	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 144, dated 28th April 1885.	Page 350, dated 19th May 1885.
58 Guernsey	13·61	G.O. No. 349, Revenue, dated 18th April 1891, embodied in B.P.F. No. 315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Page 352.
59 Gudakalhalla	286·08	G.O. No. 374, Revenue, dated 27th April 1891, embodied in B.P.F. No. 281, dated 30th June 1891.	No. 206, dated 5th May 1891.	Pages 382 and 386, dated 6th May 1891.
60 Do. Addition No. I.	37·78	G.O. No. 1041, Revenue, dated 8th November 1901, embodied in B.P.F. No. 354, dated 23rd November 1901.	No. 435, dated 12th November 1901.	Page 1941.
61 Gudakalhalla Addition No. II.	70·20	Do.	Do.	Do.
62 Gudakalhalla No. III..	53·77	G.O. No. 1096, Revenue, dated 30th October 1900, embodied in B.P.F. No. 474, dated 26th November 1900.	No. 486, dated 6th November 1900.	Page 1586, dated 6th November 1900.
63 Gundakal reserve ..	599·62	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1896.
64 Gundorai	9·33	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
65 Do. Addition ..	21·70	G.O. No. 353, Revenue, dated 1st May 1901, embodied in B.P.F. No. 200, dated 1st June 1901.	No. 221, dated 7th May 1901.	Pages 798 and 799.
66 Gathada	10·02	G.O. No. 737, Revenue, dated 23rd July 1900, embodied in B.P.F. No. 339, dated 14th August 1900.	No. 347, dated 23rd July 1900.	Page 1166, dated 31st July 1900.
67 Gwatkin	6·63	G.O. No. 112, Revenue, dated 6th February 1903, embodied in B.P. No. 57, Forest, dated 26th February 1903.	No. 71, dated 10th February 1903.	Page 162.
68 Hill Grove	130·52	G.O. No. 1050, dated 15th September 1885, embodied in B.P. No. 2788-F-550, dated 3rd October 1885.	No. 276, dated 15th September 1885.	Page 647, dated 2nd October 1885.
69 Hill Grove Addition ..	2·31	G.O. No. 865, Revenue, dated 19th August 1903, embodied in B.P. No. 238, dated 3rd September 1903.	No. 342, dated 19th August 1903.	Page 931.
70 Hulikal Drug	3,692·37	G.O. No. 224, Revenue, embodied in B.P. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 339, dated 7th April 1886.
71 Halakaray	171·92	G.O. No. 349, Revenue, dated 20th April 1891, embodied in B.P.F. No. 315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Page 351.
72 Do. Addition I ..	13·61	G.O. No. 944, Revenue, dated 10th September 1900, embodied in B.P.F. No. 414, dated 5th October 1900.	No. 417, dated 10th September 1900.	....
73 Do. Addition II.	56·60	G.O. No. 1176, Revenue, dated 23rd November 1900, embodied in B.P.F. No. 5, dated 7th January 1901.	No. 525, dated 11th December 1900.	Page 1727.
74 Hadumund	78·36	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
75 Do. Addition I.	45·93	G.O. No. 190, Revenue, dated 23rd December 1903, embodied in B.P.F. No. 88, dated 20th March 1903.	No. 99, dated 3rd March 1903.	Page 286.
76 Do. Addition II.	17·72	Do.	Do.	Do.

Serial number and name of reserved forest.	*Area in acres.*	*Reference to authority communicating section 16 notification.*	*Section 16 notification number and date.*	*Page in* Fort St. George Gazette.
(1)	(2)	(3)	(4)	(5)
		Coonoor Range—cont.		
77 Hali Adi Shola ..	2·87	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P.F. No. 45, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
78 Honnatholai South ..	221·66	G.O. No. 188, Revenue, dated 13th March 1886, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 194, dated 7th March 1886.
79 Ittakal No. I	10·03	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
80 Do. No. II	11·15	Do.	Do.	Do.
81 Imbarahatti	2·26	G.O. No. 467, Revenue, dated 7th May 1903, embodied in B.P.F. No. 152, dated 28th May 1903.	No. 196, dated 12th May 1903.	Page 548.
82 Illithorai block ..	17·67	G.O. No. 683, Revenue, dated 6th July 1903, embodied in B.P. No. 205, dated 22nd July 1903.	No. 290, dated 14th July 1903.	Page 749.
83 Kerbetta	11·99	G.O. No. 422, Revenue, dated 8th April 1885, communicated in B.P. No. 1271-F-237, dated 28th April 1885.	No. 119, dated 22nd April 1885.	Page 290, dated 28th April 1885.
84 Kesalhada Shola ..	55·54	Do.	Do.	Page 289, dated 28th April 1885.
85 Kunnavara	100·00	G.O. No. 422, Revenue, dated 8th April 1885, communicated in B.P. No. 1271-F-237, dated 28th April 1885.	Do.	Page 290, dated 28th April 1885.
86 Do. Addition I.	72·33	G.O. No. 374, dated 27th April 1891, embodied in B.P. No. 281 (L.R.), dated 30th June 1891.	No. 206, dated 27th April 1891.	Page 384, dated 5th May 1891.
87 Do. Addition II.	10·25	Do.	Do.	Page 385, dated 5th May 1891.
88 Do. Addition III.	0·18	G.O. No. 186, Revenue, dated 23rd February 1903, embodied in B.P.F. No. 84, dated 20th March 1903.	No. 91, dated 3rd March 1903.	Page 281.
89 Kodamalai No. I. ..	15·45	G.O. No. 374, Revenue, dated 27th April 1891, embodied in B.P.F. No. 281, dated 30th June 1891.	No. 206, dated 27th April 1891.	Page 382, dated 5th May 1891.
90 Do. No. II ..	18·14	G.O. No. 681, Revenue, dated 29th June 1904, embodied in B.P.F. No. 143, dated 23rd July 1904.	No.263,dated 5th July 1904.	Page 662.
91 Kallur	148·94	G.O. No. 374, Revenue, dated 27th April 1891, embodied in B.P.F. No. 281, dated 30th June 1891.	No. 206, dated 27th April 1891.	Page 382, dated 5th May 1891.
92 Kallur Addition I ..	151·21	G.O. No. 683, dated 6th July 1903, embodied in B.P.F. No. 205, dated 22nd July 1903.	No. 290, dated 14th July 1903.	Page 748.
93 Kanavathi	16·33	G.O. No. 374, dated 27th April 1891, embodied in B.P. No. 281 L.R., dated 30th June 1891.	No. 206, dated 27th April 1891.	Pages 382 and 385, dated 5th May 1891.
94 Kuttadu Addition II. ..	16·60	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
95 Krikanara No. I ..	8·83	Do.	Do.	Do.
96 Do. No. II ..	14·82	Do.	Do.	Do.
97 Kunshola No. I .. } **98** Do. No. II .. }	158·82	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	Do.	Do.
99 Kunshola Addition I. ..	17·05	G.O. No. 2488, Revenue, dated 9th September 1909, communicated with B.P.F. No. 183, dated 2nd October 1909.	No. 397, dated 9th September 1909.	Page 977, dated 28th September 1909.
100 Kelatti	16·88	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
101 Konakarai slopes ..	1,865·95	G.O. No. 326, Revenue, dated 4th April 1892, For B.P. No. 57 For 242 (L.R.), dated 20th May 1892.	No. 88, dated 13th March 1886.	Page 194, dated 17th March 1886.
102 Konakarai slopes Addition.	157·01	G.O. No. 997, Revenue, dated 30th September 1903, embodied in B.P.F. No. 273, dated 17th October 1903.	No. 403, dated 6th October 1903.	Page 1114.
103 Kodanad valley ..	294·00	G.O. No. 326, Revenue, dated 4th April 1892, embodied in B.P. No. 57-F-242, dated 20th May 1892.	No. 88, dated 13th March 1886.	Page 194, dated 17th March 1886.
104 Kodanad valley Addition No. I.	75·12	G.O. No. 22, Revenue, dated 24th February 1904 embodied in B.P.F. No. 51, dated 22nd March 1904.	No.86, dated 1st March 1904.	Page 240.
105 Kodanad valley Addition No. II.	170·40	G.O. No. 362, Revenue, dated 25th April 1905, embodied in B.P.F. No. 106, dated 15th May 1905.	No. 178, dated 2nd May 1905.	Page 343.
106 Kubar	215·76	G.O. No. 1273, Revenue, dated 19th December 1892, embodied in B.P. No. 56-F 319, dated 25th January 1893.	No. 7, dated 19th December 1892.	Pages 14 and 15, dated 10th January 1893.
107 Kolakombe	724·46	G.O. No. 423, Revenue, dated 15th May 1893, B.P.F. No. 440, dated 9th July 1893.	No. 268, dated 15th May 1893.	Pages 596 and 597, dated 30th May 1893.
108 Kodoru	21·19	G.O. No 638, Revenue, dated 17th July 1893, embodied in B.P. No. 257-F 597 (L.R.), dated 7th August 1893.	No. 117, dated 23rd March 1886.	Page 339, dated 7th April 1886.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	**Page in Fort St. George Gazette.** (5)
		Coonoor Range—cont.		
109 Koderu Addition No. I.	36·47	G.O. No. 920, Revenue, dated 4th September 1903, embodied in B.P.F. No. 249, dated 24th September 1903.	No. 355, dated 8th September 1903.	Page 1013.
110 Koderu Addition No. II.	4·92	G.O. No. 1177, Revenue, dated 23rd November 1900, embodied in B.P.F., No. 2, dated 7th January 1901.	No. 526, dated 11th December 1900.	Page 1728.
111 Koderu Addition III.	21·11	Do.	Do.	Do.
112 Katteri	26·73	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 25th November 1896.	Pages 1479 and 1483 dated 1st December 1896.
113 Kudikadu	38·98	Do.	Do.	Do.
114 Konemara	10·62	G. O. No. 165, Revenue, dated 6th March 1899, B.P.F. No. 147, dated 28th March 1899.	No. 99, dated 6th March 1899.	....
115 Kilur	2·83	G.O. No. 150, Revenue, dated 27th February 1901, embodied in B.P.F No. 114, dated 21st March 1901.	No. 129, dated 19th March 1901.	Pages 387 and 389.
116 Kodanad Valley Block Addition No. III.	68·90	G.O. No. 1757, Development, dated 7th December 1925, C.C.P.'s. No. 325, dated 16th December 1925.	No. 361, dated 21st November 1925.	Pages 2304 and 2305.
117 Kilingadi	3·14	G.O. No. 1029, Revenue, dated 5th November 1901, embodied, in B.P.F. No. 353, dated 23rd November 1901.	No. 437, dated 12th November 1901.	Page 1942.
118 Kannerihodai	16·90	G.O. No. 160, Revenue, dated 17th February 1903, embodied in B.P.F. No. 85, dated 20th March 1903.	No. 92, dated 3rd March 1903.	Page 282.
119 Kottekadodecole No. I.	4·89	G.O. No. 146, Revenue, dated 16th February 1903, embodied in B.P.F. No. 91, dated 24th March 1903.	No. 97, dated 3rd March 1903.	Page 285.
120 Kottekadodecole No. II.	7·62	Do.	Do.	Do.
121 Ketty Valley Block ..	42·63	G.O. No. 3401, Revenue, dated 11th November 1912, B.P.No.222–F, dated 27th November 1912.	No. 136, dated 2nd March 1914.	Page 403, dated 17th March 1914.
122 Tadeola	28·35	G.O. No. 190, Revenue, dated 23rd February 1903, embodied in B.P.F. No. 88, dated 20th March 1903.	No. 99, dated 3rd March 1903.	Page 286.
123 Kamari	49·00	G.O. No. 353, Revenue, dated 1st May 1901, embodied in B.P.F. No. 200, dated 1st June 1901.	No. 221, dated 7th May 1901.	Pages 798 and 799.
124 Lamb's Rock Shola No. I.	257·76	G.O. No. 1321, Revenue, dated 1st December 1884, embodied in B.P. No. 4276 F. 446, dated 12th December 1884.	No. 231, dated 1st December 1884.	Page 795, dated 9th December 1884.
125 Lamb's Rock Shola No. II.	439·18	G.O. No. 1050, dated 15th September 1885, embodied in B.P. No. 2788–F–550, dated 3rd October 1885.	No. 276, dated 15th September 1885.	Page 647, dated 2nd October 1885.
126 Longwood	287·81	G.O. No. 422, dated 8th April 1885, communicated with B.P. No. 1271–F–237, Public, dated 28th April 1885.	No. 119, dated 22nd April 1885.	Page 289, dated 28th April 1885.
127 Longwood Addition No. I.	30·73	G.O. No. 349, Revenue, dated 20th April 1891, embodied in B.P. No.315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Page 351.
128 Longwood Addition No. I Block I.	28·66	Do.	Do.	Do.
129 Longwood Block II ..	2·07	G.O. No. 326, Revenue, dated 4th April 1892, Forest B.P.F. No. 57–242, dated 20th May 1892.	No. 290, dated 14th July 1903.	Page No. 749.
130 Longwood Block II ..	47·77	G.O. No. 683, Revenue, dated 6th July 1903, embodied in B.P.F. No. 205, dated 22nd July 1903.	No. 290, dated 5th July 1903.	Page 748.
131 Lay Cunning's Seat ..	113·38	G.O. No. 681, Revenue, dated 29th June 1904, embodied in B.P. No. 143, dated 23rd July 1904.	No. 263, dated 5th July 1904.	Page 663.
132 Little Rallia	24·14	G.O. No. 349, Revenue, dated 20th April 1891, embodied in B.P. No. 315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Page 350.
133 Mavada	210·88	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
134 Mavada Addition I ..	92·90	G.O. No. 737, Revenue, dated 23rd July 1900, embodied in B.P.F. No. 339, dated 14th August 1900.	No. 347, dated 23rd July 1900.	Page 1166, dated 31st July 1900.
135 Mavada Addition II ..	90·35	G.O. No. 205, Revenue, dated 6th March 1905, embodied in B.P. No. 80, dated 28th March 1905.	No. 85, dated 9th February 1905.	Page 206.
136 Madanad	722·54	G.O. No. 325, Revenue, dated 4th April 1892, Forest B.P. No. 242, dated 20th May 1892.	No. 88 dated 13th March 1886.	Page 194, dated 17th March 1886.
137 Madanad Addition I ..	708·51	G.O. No. 149, Revenue, dated 5th February 1904, embodied in B.P.F. No. 47, dated 16th March 1904.	No. 58, dated 9th February 1904.	Page 164.
138 Melur Slopes	917·46	G.O. No. 374, Revenue, dated 2nd May 1893, embodied in B.P.F. No. 389, dated 2nd June 1893.	No. 235, dated 2nd May 1893.	....
139 Mokkai	16·07	G.O. No. 165, Revenue, dated 6th March 1899. Forest B.P. No. 147, dated 28th March 1899.	No. 99, dated 6th March 1899.	....
140 May Field	6·57	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P.F. No. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in* Fort St. George Gazette. (5)
		Coonoor Range—cont.		
141 Mulisappa	6·99	G.O. No. 1156, Revenue, dated 12th December 1901, embodied in B.P.F. No. 8, dated 4th January 1902.	No. 483, dated 17th December 1901.	Page 2064.
142 Mandileru	63·70	G.O. No. 189, Revenue, dated 23rd March 1903, embodied in B.P. No. 89–Forest, dated 20th March 1903.	No. 98, dated 3rd March 1903.	Page 285.
143 Masikadavu	12·89	G.O. No. 1034, Revenue, dated 8th October 1903, embodied in B.P. No. 279–Forest, dated 22nd October 1903.	No. 412, dated 13th October 1903.	Page 1138.
144 Madanad Addition II ..	202·20	....	No. 215, dated 23rd June 1929.	Page 1291, dated 2nd July 1929.
145 Nedukaduhalla ..	885·43	G.O. No. 991, Revenue, dated 5th December 1890, embodied in B.P. No. 35, Forest, dated 22nd January 1891.	No. 539, dated 5th December 1890.	Page 308, dated 21st April 1891.
146 Nedukaduhalla Addition.	158·35	G.O. Mis. No. 1757, dated 7th February 1925, Development, (R. Dis. No. 1533–24, C.C.P., Mis. No. 325, dated 16th December 1925).	No. 361, dated 21st November 1925.	Pages 2304 and 2305 dated 1st December 1925.
147 Nedugula	88·74	G.O. No. 326, Revenue, dated 4th April 1892, Forest 57-(L.R.), B.P. For 242, dated 20th May 1892.	No. 88, dated 13th March 1886.	Page 194, dated 17th March 1886.
148 Nedugula Addition No. I.	30·60	G.O. Mis. No. 1757, Development, dated 7th December 1925, C.C.P. Mis. No. 325, dated 16th December 1925.	No. 361, dated 21st November 1925.	Pages 2304 and 2305 dated 1st December 1925.
149 Nedugula Addition No. II.	113·36	G.O. No. 146, Revenue, dated 16th February 1903, embodied in B.P.F. No. 91, dated 24th March 1903.	No. 97, dated 3rd March 1903.	Page 25
150 Neyyatti	14·23	G.O. No. 667, Revenue, dated 25th November 1896, B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896
151 Neyyatti Addition I ..	34·95	G.O. No. 681, Revenue, dated 29th June 1904, embodied in B.P.F. No. 143, dated 23rd July 1904.	No. 263, dated 5th July 1904.	Page 662.
152 Nirbura or Nirburra-halla.	175·04	G.O. No. 496, dated 28th June 1897 ..	No. 287, dated 6th July 1897.	Page 819, dated 6th July 1897
153 Nirmugihulla	17·13	G.O. No. 1041, Revenue, dated 8th November 1901, embodied in B.P.F. No. 354, dated 22nd November 1901.	No. 8435, dated 12th November 1901.	Page 1941.
154 Niralimara Block I ..	8·87	G.O. No. 146, dated 16th February 1903, embodied in B.P. Forest No. 91, dated 24th March 1903.	No. 97, dated 3rd March 1903.	Page 285.
155 Niralimara Block II ..	1·77	G.O. No. 186, Revenue, dated 23rd February 1903, embodied in B.P. No. 84–Forest, dated 20th March 1903.	No. 91, dated 3rd March 1903.	Page 281.
156 Nilgiri Eastern Slopes.	54,592·71	G.O. No. 168, Revenue, dated 5th March 1886, communicated with B.P. No.648–F-118, dated 20th March 1886.	No. 87, dated 5th March 1886.	Page 298.
157 Naduhatti	476·00	G.O. No. 173, Revenue, Forest 31, dated 23rd February 1892, B.P. (L.R.), dated 8th March 1892.	No. 79, dated 23rd February 1892.	....
158 Naduhatti Addition ..	1·96	G.O. No. 758, Revenue, dated 13th March 1917, embodied in B.P.F. No. 40, dated 23rd March 1917.	No. 157, dated 13th March 1917.	Page 410, dated 27th March 1917.
159 Osatti	150·58	G.O. No. 752, Revenue, dated 23rd July 1892, B.P. No. 155–F–445, (L.R.), dated 19th August 1892.	No. 337, dated 23rd July 1892.	Page 978, dated 2nd August 1892.
160 Osatti Addition I ..	63·31	G.O. No. 667, Revenue, dated 25th November 1896, embodied in B.P.F. No. 575 dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
161 Osatti Addition II ..	5·31	Do.	Do.	Do.
162 Ottupalladai	4·38	G.O. No. 566, Revenue, dated 13th June 1900 (Forest No. 120), B.P.F. No. 281, dated 4th July 1900	No. 287, dated 13th June 1900.	....
163 Okkamandu	2·87	G.O. No. 1094, Revenue, dated 30th October 1900 and B.P.F. No. 475, dated 26th November 1900.	No. 483, dated 16th November 1900.	Page 1585.
164 Oland	4·70	G.O. No. 1177, embodied in B.P. No. 2, Forest, dated 7th January 1901.	No. 526, dated 11th December 1900.	Page 1728.
165 Odesakadu	46·88	G.O. No. 683, Revenue, dated 6th July 1903, embodied in B.P. No. 205, dated 22nd July 1903.	No. 290, dated 6th July 1903.	Page 748, dated 14th July 1903.
166 Pembroke	115·25	G.O. No. 224, Revenue, embodied in B.P. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Page 339, dated 7th April 1886.
167 Pakasuramalai	624·18	G.O. No. 785, Revenue (Forest No. 167), dated 1st August 1892 and B.P.L.R. Forest 475, dated 5th September 1892.	No. 848, dated 1st August 1892.	Page 1013, dated 9th August 1892.
168 Pillur Shola	38·62	Do.	Do.	Do.
169 Pillur Addition	16·25	G.O. No. 353, Revenue, dated 1st May 1901, embodied in B.P. No. 200, dated 1st June 1901.	No. 221, dated 7th May 1901.	Pages 798 and 799.
170 Pattakarai	9·78	G.O. No. 667, Revenue, dated 25th November 1886, embodied in B.P.F. No. 575, dated 17th December 1896.	No. 566, dated 5th November 1896.	Page 1479, dated 1st December 1896.
171 Pillimalai Korai ..	14·37	Do.	Do.	Do.

Serial number and name of reserved forest. (1)	*Area in acres.* (2)	*Reference to authority communicating section 16 notification.* (3)	*Section 16 notification number and date.* (4)	*Page in Fort St. George Gazette.* (5)
		Coonoor Range—cont.		
172 Panola	0·51	G.O. No. 150, Revenue, dated 27th February 1901, embodied in B.P.F. No. 114, dated 21st March 1901.	No. 129, dated 19th March 1901.	Pages 387 to 389.
173 Paranchoti	8·66	Do.	Do.	Do.
174 Pambre No. I	21·37	G.O. No. 190, Revenue, dated 23rd February 1903, embodied in B.P. No. 88, Forest, dated 20th March 1903.	No. 99, dated 3rd March 1903.	Page 286.
175 Pambre No. II ..	13·94	Do.	Do.	Do.
176 Pommanu Reserve ..	47·29	G.O. No. 395, Revenue, dated 18th April 1903, embodied in B.P. No. 137, dated 18th May 1903.	No. 160, dated 28th April 1903.	Page 485, dated 21st April 1903.
176 (a) Pommanu Addition.	0·36	G.O. Ms. No. 3644, Development, dated 12th September 1950.	....	....
177 Paruvakadavu	670·33	G.O. No. 1180, Revenue, dated 22nd October 1904, embodied in B.P.F. No. 231, dated 21st November 1904.	No. 397, dated 22nd October 1904.	Pages 1230 and 1231, dated 22nd November 1904.
178 Rangaswami Peak ..	1,430·64	G.O. No. 2398, Revenue (Special), dated 23rd December 1919.	No. 5, dated 23rd December 1919.	Page 36, dated 6th January 1920.
179 Rajpay	45·23	G.O. No. 737, Revenue, dated 23rd July 1900, embodied in B.P.F. No. 339, dated 14th August 1900.	No. 347, dated 23rd July 1900.	Page 1166, dated 31st July 1900.
180 Rallia Shola	29·99	G.O. No. 349, Revenue, dated 20th April 1891, embodied in B.P. No. 315, dated 18th July 1891.	No. 193, dated 28th April 1891.	Page 315, dated 28th April 1891.
181 Rallia Reserve Addition I.	2·55	G.O. No. 1184, Revenue, dated 28th November 1892 and B.P.F. No. 720, dated 17th December 1892.	No. 563, dated 28th November 1892.	....
182 Rallia Reserve Addition II.	3·28	G.O. No. 1041, Revenue, dated 8th November 1901, embodied in B.P.F. No. 354, dated 23rd November 1901.	No. 435, dated 12th November 1901.	Page 1941.
183 Rallia	374·34	G.O. No. 170, Revenue (Forest No. 28), dated 23rd February 1892 and B.P. L.R. For. No. 110, dated 14th March 1892.	No. 81, dated 23rd February 1892.	....
184 Sims Park I	47·93	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86-F-16, dated 14th January 1885.	No. 133, dated 28th April 1885.	Pages 350 and 351 dated 19th May, 1885.
185 Sims Park II	36·02	G.O. No. 1321, Revenue, dated 1st December 1884, embodied in B.P. No. 4276-F-446, dated 12th December 1884.	No. 231, dated 1st December 1884.	Page 795, dated 9th December 1884.
186 Spring Field	34·50	Do.	Do.	Do.
187 Suttonshola	14·42	G.O. No. 224, Revenue, embodied in B.P.F. No. 168, dated 3rd April 1886.	No. 117, dated 23rd March 1886.	Pages 338 and 339, dated 7th April 1886.
188 Saint Catherine Fawl ..	123·94	G.O. No. 374, Revenue, dated 27th April 1891, embodied in B.P.F. No. 281, dated 30th April 1891.	No. 206, dated 27th April 1891.	Page 383, dated 5th May 1891.
189 Sham Rock	42·89	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
190 Sundathi	123·86	Do.	Do.	Do.
191 Sundathi Addition ..	35·16	G.O. No. 146, Revenue, dated 16th February 1903, embodied in B.P.F. No. 91, dated 24th March 1903.	No. 97, dated 31st March 1903.	Page 285.
192 Sampangi	51·68	G.O. No. 146, Revenue, dated 27th February 1899, embodied in B.P.F. No. 148, dated 28th March 1899.	No. 386, dated 18th August 1898.	Page 793, dated 18th August 1898.
193 Salemara	10·28	G.O. No. 165, Revenue, dated 6th March 1899, Forest 45, B.P.F. No. 147, dated 28th March 1899.	No. 99, dated 6th March 1899.	....
194 Salada	9·40	G.O. No. 400, Revenue, dated 27th April 1900, embodied in B.P.F. No. 219, dated 25th May 1900.	No. 211, dated 27th April 1900.	....
195 Selekallu	4·45	Do.	Do.	....
196 Selaodai II	2·22	G.O. No. 1177, Revenue, dated 23rd November 1900, embodied in B.P.F. No. 2, dated 7th January 1901.	No. 526, dated 11th December 1900.	Page 1728.
197 Sulapani	16·50	G.O. No. 150, Revenue, dated 23rd November 1900, embodied in B.P.F. No. 114, dated 21st March 1901.	No. 129, dated 21st March 1901.	Pages 387 and 389, dated 19th March 1901.
198 Sevenmile thope ..	2·02	G.O. No. 186, Revenue, dated 23rd February 1903, embodied in B.P.F. No. 84, dated 20th March 1903.	No. 91, dated 3rd March 1903.	Page 281.
199 Sullicode Block I ..	1·07	G.O. No. 467, Revenue, dated 7th May 1903, embodied in B.P.F. No. 152, dated 28th May 1903.	No. 196, dated 12th May 1903.	Page 548.
200 Sullicode Block II ..	307·38	G.O. No. 945, dated 14th September 1903, Revenue, embodied in B.P.F. No. 259, dated 2nd October 1903.	No. 378, dated 22nd September 1903.	Page 1068.
201 Shant	15·90	G.O. No. 1355, Revenue, dated 10th December 1904, embodied in B.P.F. No. 9, dated 5th January 1905.	No. 430, dated 13th December 1904.	Page 1288.

Serial number and name of reserved forest.	*Area in acres.*	*Reference to authority communicating section 16 notification.*	*Section 16 notification number and date.*	*Page in Fort St. George Gazette.*
(1)	(2)	(3)	(4)	(5)
		Coonoor Range—cont.		
202 Sinnattu	50·83	G.O. No. 972, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
203 Tiger Hill	301·14	G.O. No. 1407, Revenue, dated 18th December 1884, embodied in B.P. No. 86, Public F. 16, dated 14th January 1885.	No. 144, dated 28th April 1885.	Page 351, dated 19th May 1885.
204 Tattupalam	47·21	G.O. No. 374, dated 27th April 1891, embodied in B.P. No. 281, Forest, dated 30th June 1891.	No. 206, dated 27th April 1891.	Page 383, dated 5th May 1891.
205 Todar Shola	15·64	G.O. No. 463, Revenue, Forest No. 86, dated 10th May 1892, B.P. (L.R.) Forest No. 301, dated 9th June 1892.	No. 198, dated 10th May 1892.	Page 638, dated 17th May 1892.
206 Thogalhatti	18·57	G.O. No. 165, Revenue, dated 6th March 1899, embodied in B.P.F. No. 147, dated 28th March 1899.	No. 99, dated 6th March 1899.	....
207 Tamugai	14·63	G.O. No. 566, Revenue, dated 13th June 1900, Forest, 120, B.P.F. No. 281, dated 4th July 1900.	No. 287, dated 13th June 1900.	....
208 Thambarakadavu ..	22·50	G.O. No. 944 Revenue, dated 10th September 1900, (Forest No. 185) B. P.F. No. 414, dated 5th October 1900.	No. 417, dated 10th September 1900.	....
209 Tiger Lodge	5·71	G.O. No. 1094, Revenue, dated 30th October 1900, embodied in B.P.F. No. 475, dated 26th November 1900.	No. 483, dated 6th November 1900.	Page 1585, dated 6th November 1900.
210 Toluyemmaiyatti ..	19·93	G.O. No. 186, Revenue, dated 23rd February 1903, embodied id B.P. No. 84, dated 20th March 1903.	No. 91, dated 3rd March 1903.	Page 281.
211 Turachibettu shola ..	57·11	G.O. No. 395, Revenue, dated 18th April 1903, embodied in B.P.F. No. 137 Forest, dated 18th May 1903.	No. 160, dated 21st April 1903.	Page 485.
212 Teppakuchi	115·24	G.O. No. 282, Revenue (Forest No. 52), dated 21st March 1892, B.P. (L.R.), Forest No. 201, dated 27th April 1892.	No. 130, dated 21st March 1892.	....
213 Teppakuchi addition ..	3·74	G.O. No. 939, Revenue (Forest No. 208), dated 7th September 1892, B.P. (L.R.), Forest No. 526, dated 29th September 1892.	No. 152, dated 12th April 1892.	Pages 509 and 510, dated 26th April 1892.
214 Uppatti	52·61	G.O. No. 972, Revenue, dated 14th October 1891, B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
215 Uppatti addition ..	15·05	G.O. No. 40, Revenue, dated 12th January 1904, embodied in B.P. No. 27, Forest, dated 18th February 1904.	No. 36, dated 19th January 1904.	Page 96.
216 Ullavanadmund shola.	56·55	G.O. No. 972, Revenue, dated 14th October 1891, embodied in B.P.F. No. 531, dated 11th December 1891.	No. 28, dated 15th January 1892.	Page 96, dated 19th January 1892.
217 Ullavanadmund addition I.	46·00	G.O. No. 996, Revenue, dated 30th September 1903, embodied in B.P. No. 276, Forest, dated 15th October 1903.	No. 401, dated 6th October 1902.	Page 1113.
218 Ullavanadmund addition II.	16·05	G.O. No. 190, Revenue, dated 23rd February 1903, embodied in B.P. No. 88, Forest, dated 20th March 1903.	No. 99, dated 3rd March 1903.	Page 286.
219 Uchukadavu	5·89	G.O. No. 165, Revenue, dated 6th March 1899 (Forest No. 45), B.P.F. No. 147, dated 28th March 1899.	No. 99, dated 6th March 1899.	....
220 Uradihalli	36·42	G.O. No. 400, Revenue, dated 27th April 1900, embodied in B.P.F. No. 219, dated 25th May 1900.	No. 211, dated 27th April 1900.	....
221 Ullani	6·97	G.O. No. 737, Revenue, dated 23rd July 1900, embodied in B.P.F. No. 339, dated 14th August 1900.	No. 347, dated 23rd July 1900.	Page No. 1166, dated 31st July 1900.
222 Udiyarai Reserve ..	26·86	G.O. No. 1041, Revenue, dated 8th November 1901, embodied in B.P.F. No. 354, dated 23rd November 1901.	No. 435, dated 12th November 1901.	Page 1941.
223 Vagapani	2,798·84	G.O. No. 939, Revenue (Forest No. 208), dated 7th September 1892, and B.P. (L.R.) Forest No. 526, dated 29th September 1892.	No. 152, dated 12th April 1892.	Pages 509 and 510, dated 6th April 1892.
224 Vagapani addition I	32·69	G.O. No. 4, Revenue, dated 8th January 1901, embodied in B.P.F. No. 46, dated 7th February 1901.	No. 29, dated 15th January 1901.	....
225 Vagapani addition II ..	42·39	G.O. No. 566, Revenue, dated 13th June 1900, Forest 120, B.P.F. No. 281, dated 4th July 1900.	No. 287, dated 13th June 1900.	....
226 Warwick I	7·78	G.O. No. 1041, Revenue, dated 8th November 1901, embodied in B.P.F. No. 354, dated 23rd November 1901.	No. 435, dated 12th November 1901.	Page 1941
227 Warwick II	11·85	G.O. No. 1096, Revenue, dated 30th October 1900, embodied in B.P.F. No. 474.	No. 486, dated 6th November 1900.	Page 15[illegible]
228 Warwick III	4·70	G.O. No. 1041, Revenue, dated 8th November 1901. embodied in B.P.F. No. 354, dated 23rd November 1901.	No. 435, dated 12th November 1901.	Page 1941

Serial number and name of reserved forest. (1)	Area in acres. (2)	Reference to authority communicating section 16 notification. (3)	Section 16 notification number and date. (4)	Page in Fort St. George Gazette. (5)
		Coonoor Range—cont.		
229 Warbreccan	17·93	G.O. No. 648, Revenue, dated 29th June 1903, embodied in B.P. No. 201, Forest, dated 21st August 1903.	No. 281, dated 7th July 1903.	Page 726.
230 Yercaudhulla I ..	19·77	....	No. 113, dated 15th March 1892.	....
231 Yercaudhulla I ..	3·35	G.O. No. 53 Revenue (Forest No. 9), dated 15th January 1892 and B.P. (L.R.) Forest No. 90, dated 25th February 1892.	No. 206, dated 5th May 1891.	Pages 382 and 386.
	59,573·47-3/16			
		Sigur Range.		
1 Avaraihalla (Todanad).	6,425·28	G.O. No. 425, Revenue, dated 18th June 1894 (Forest No. 167), B.P.F. No. 452, dated 9th July 1894.	No. 248, dated 17th May 1900.	....
2 Bockapuram	1,974·48	G.O. No. 188, Revenue, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 194, dated 17th March 1886.
3 Bockapuram addition I.	5·11	G.O. No. 2932, Revenue, embodied in B.P. No. 222, dated 20th September 1910.	No. 499, dated 5th September 1910.	Page 1551, dated 20th September 1910.
4 Bockapuram addition II.	3·91	Do.	Do.	Do.
5 Bockapuram addition III.	3·84	Do.	Do.	Do.
6 Kalhatti	4,925·66	G.O. No. 188, Revenue, dated 20th April 1900 (Forest No. 71), B.P.F. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 197, dated 17th March 1886.
7 Kalhatti addition ..	87·99	G.O. No. 1188, dated 28th June 1925 ..	No. 76, dated 9th March 1923.	Page 291, dated 15th June 1923.
8 Kalmalai	896·00	G.O. No. 608, Revenue, dated 5th September 1895, and B.P.F. No. 588, dated 7th October 1895.	No. 85, dated 14th March 1885.	Page 215, dated 24th March 1885.
9 Kalmalai addition ..	40·73	G.O. No. 1328, Revenue, dated 9th May 1917, Forest B.P.F. No. 61, dated 18th May 1917.	No. 232, dated 15th May 1917.	Pages 620 and 621.
10 Moyar	13,237·76	G.O. No. 188, Revenue, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 13th March 1886.	Page 194, dated 17th March 1886.
11 Moyar addition ..	342·22	B.P.F. No. 185, dated 29th March 1887.	No. 281, dated 12th October 1886.	Page 657, dated 23rd July 1886.
12 Northern Hay	3,954·04	G.O. No. 888, Revenue, dated 12th October 1886, embodied in B.P.F. No. 593, dated 27th October 1886.	No. 380, dated 12th October 1886.	Page 967, dated 26th October 1886.
13 Singara	1,835·11	G.O. No. 188, Revenue, dated 20th April 1900, embodied in B.P. No. 769-F-152, dated 30th March 1886.	No. 88, dated 30th March 1886.	Page 197, dated 17th March 1886.
14 Singara addition ..	379·00	G.O. No. 634, Revenue, dated 16th September 1895, and B.P.F. No. 600, dated 10th October 1895.	No. 529, dated 6th September 1905.	....
15 Sigur I	46,484·00	G.O. No. 510, Revenue (Forest No. 206), dated 16th July 1894 and B.P.L.R. Forest No. 527, dated 9th August 1894.	No. 366, dated 16th July 1894.	Pages 883 and 884, dated 24th July 1894.
16 Sigur II	3,000·00	....	....	....
	83,595·13			
		Mudumalai Range.		
1 Benne	10,392·19	G.O. No. 324, Revenue, dated 14th March 1885, embodied in B.P. No. 991-F-181, dated 25th March 1885.	No. 85, dated 14th March 1885.	Page 215, dated 24th March 1885.
2 Benne addition I ..	724·34	G.O. No. 25, Revenue, dated 11th January 1888, embodied in B.P.F. No. 85, dated 21st February 1888.	No. 18, dated 17th January 1888.	Page 37, dated 17th January 1888.
3 Benne addition II ..	122·86	....	No. 215, dated 3rd May 1894.	....
4 Benne addition III ..	84·25	G.O. No. 1328, Revenue, dated 9th May 1917, embodied in B.P.F. No. 61, dated 18th May 1917.	No. 232, dated 15th May 1917.	Pages 620 and 621.
5 Benne addition IV ..	62·78	Do.	Do.	Do.
6 Benne addition V ..	11·09	G.O. No. 707, dated 13th May 1935 and C.C.P's. Ms. No. 218, dated 20th May 1935.	No. 75, dated 12th February 1935.	Page 311, dated 11th February 1935.
7 Gadsbrook Reserve ..	230·21	G.O. No. 25, Revenue, dated 11th January 1888, embodied in B.P.F. No. 85, dated 21st February 1898.	No. 18, dated 17th January 1888.	Page 38, dated 17th January 1888.
8 Kumbarakolli .. .. } 9 Mudumalai .. .. }	47,841·26	....	No. 349, dated 1st October 1929.	Pages 840 and 842, dated 8th October 1929.
	59,458·98			

ABSTRACT.

Serial number and range.	Number of reserves.	Area in acres.
1 Ootacamund, North	86	36,756·69
2 Ootacamund, South	87	73,792·83
3 Coonoor	232	59,573·47
4 Sigur	16	83,595·13
5 Mudumalai	9	59,458·98
Total ..	430	3,13,177·10 (or) 489·3 square miles.

APPENDIX IV.

List of Labour Settlements in the Nilgiris Division.

Number and name of settlement. (1)	Revenue in which settlement is situated. (2)	Area in acres. (3)	Class of people in the settlement. (4)
	Coonoor Range.		
1 Nadugal Kombai	Melur slopes reserved forest.	62	Kurumbars.
2 Ponnari Kombai	Hulikal droog ..	42	Do.
3 Ossur Kombai	Do.	68	Do.
4 Yerukumalai Kombai	Do.	44	Do.
5 Kaval Kombai	Do.	..	Do.
6 Marimuthuputhor Kombai ..	Burliyar	12·75	Do.
7 Vagappanai	Vagappanai	..	Do.
8 Denad	Denad addition ..	..	Do.
9 Gargayur	Konakarai slopes ..	..	Irulas.
10 Arakkode	Rangaswami Peak ..	17	Do.
	Sigur Range.		
Araikatty	Sigur	70·5	Kasabas.

APPENDIX V.

A note on the important fauna of the Nilgiris Division.

The game animals of the division include the following :—

Tiger, Elephant, Leopard, Indian (Sloth) Bear, Sambhur, Spotted, Barking, Four horned and Mouse deer, Antelope, Bison, Pig, Nilgiri Ibex, Wild Dogs, Hares and Hill Jackals.

2. The chief haunts of the Elephants are the Masinagudi-Anaikatti plateau, Mudumalai forest especially near Moyar and Kakenhalla and near Hallimoyar in the Eastern slopes. The Tiger and the Leopard are found all over the area, though not to a great extent. In the plateau region they are found in the sholas during the summer, when the heat and the forest fires of the lower slopes drive them up. The Wynaadan Chettis and the Paniyans in the Gudalur taluk forest areas make a practice of " Netting " them and killing them with spears. The Bears are seldom found on the plateau. They are common towards Mudumalai and Sirur. Sambhurs are found all over the division but are more common near Masinagudi and in the Kundahs. The spotted deer appear to never come to higher levels. They are found in herds near Masinagudi and in Mudumalai forests. Very often along the Gudalur-Teppakadu roads, herds of spotted deer can be seen early in the morning or towards dusk. The Barking Deer is also found both in the plateau and in the lower regions. It is often given the incorrect name of Jungle Sheep. Bisons are found near Benne, Mudumalai, Masinagudi and in the Kundahs, especially in Bison's Swamp.

3. The Nilgiri Ibex (Hemitragus hylocrius—really a wild goat) is a characteristic animal inhabiting the Nilgiri plateau. The only other species of the genus is ' Tarh ' of the Himalayas. The Nilgiri Ibex is common in the precipitous southern and the western slopes of the Kundahs. It is often found near the peaks. Their horns do not offer impressive trophies but they are valued for the difficulty in obtaining them, occasioned by the extreme warniess of the animal and the dangerous nature of the ground on which it lives.

4. The following list gives the names of the common species of fauna of the Nilgiris division :—

1 Sambhur—Rusa unicolor.
2 Cheetal (or) Spotted deer—Axis axis.
3 Bison—Bibos gaurus.
4 Four-horned Antilope—Tetraceros quadricornis.
5 Black Buck—Antilope cerricapra.
6 Jungle Sheep (or) Barking deer—Muntiacus muntjak.
7 Ibex (Nilgiris saddle back)—Hemitragus hylocrius.
8 Tiger—Panthera tigris tigris.
9 Panther—Panthera pardus.
10 Hyæna—Hyæna hyæna.
11 Bear (Sloth)—Melursus ursinus.
12 Wild Cats—Felis chans prateri.
13 Martens—Charronia gwatkinsi.
14 Hare—Lepus ruficandalus.
15 House deer—Moschiola memina.
16 Nilgai (Blue Bull)—Boselaphus tragocamelus.
17 Jackal—Canis aureus.

18 Elephant—Elephas maximus.
19 The Indian Wild Boar—Sus cristatus.
20 The Indian Porcupine—Hystrix leucura.
21 Otters—(1) Lutrogale perspicillatus.
(2) Lutra lutra.
22 Wild Dog—Cuon alpinus.
23 Fox—Vlupes bengelensis.
24 Wolf—Canis lupus.
25 Mungoose—Herpestes edwardsii.
26 The Nilgiri Langur—Kasi johnii.
27 Giant squirrel—Ratufa indica.
28 The common langur (Monkey)—Semnopithecus eutellus.

APPENDIX VI.

*Statement showing the number and kind of animals that grazed in the **Nilgiris Division** during 1948–49 to 1951–52.*

Grazing year.	*Kind of cattle.*	*Rates.*				*Total.*
		Enhanced rates.	*Full rates.*	*Priveleged rates.*	*Free.*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1948–49	Buffaloes	10	6,950	1,069	1,054	9,083
	Cows and bulls	633	15,897	8,066	..	24,596
	Sheep	..	2,522	..	..	2,522
1949–50	Buffaloes	..	7,028	..	2,089	9,117
	Cows and bulls	544	16,735	1,079	302	18,660
	Sheep	..	3,133	3,404	..	6,537
1950–51	Buffaloes	..	7,531	..	2,337	9,868
	Cows and bulls	384	16,739	1,419	312	18,854
	Sheep	..	3,138	3,336	..	6,474
1951–52	Buffaloes	..	6,591	..	2,499	9,090
	Cows and bulls	242	15,726	1,946	376	18,290
	Sheep	..	3,094	4,615	..	7,709

APPENDIX VII.

*List of Todamunds, Badaga hundis, and other cattle **pens in the Nilgiris Division.***

Serial number and name of the pen.	Reserve in which the pen is situated.	Water-supply.	Name of the village from which cattle resort to the pen.
(1)	(2)	(3)	(4)
	Ootacamund North Range.		
1 Devagodemund hundi No. I ..	....	....	....
2 Do. No. II ..	....	....	....
3 Kabbalkode hundi No. I ..	Wenlock Downs.	....	Kalhatti.
4 Do. No. II	Do.	....	Do.
5 Kalhatti reserved forest hundi ..	Do.	....	Do.
6 Kanjikal hundi	Do.	....	Kurudugull.
7 Osamund	Do.	....	Do.
8 Piramod or Padamodmund ..	Do.	....	Do.
9 Sandynullah	Do.	....	Kunnuthukki.
10 Tharabanpatti	Do.	....	Nanjanad.
	Ootacamund South Range.		
1 Araibettu hundi	Wenlock Downs.	....	Nanjanad.
2 Attamatti hundi	Kundahs ..	....	Mulligur.
3 Bakkanoothi hundi	Do. ..	....	Do.
4 Bettumund	Do. ..	....	Do.
5 Bethal hundi	Do. ..	....	Do.
6 Bijjekore hundi	Do. ..	....	Ketchigetti.
7 Chinnakadavu	Do. ..	....	Do.
8 Doddamarahada hundi ..	Do. ..	....	Attuboil.
9 Doddabettakorai hundi ..	Do. ..	....	Porthi.
10 Ettikkalpatti No. I	Wenlock Downs.	....	Hullatti.
11 Do. No. II	Do.	....	Do.
12 Halkore hundi	Porthi	....	Athikal.
13 Hasar hundi	Kundahs ..	....	Yedakad.
14 Honalada hundi	Do. ..	....	Manipatti.
15 Hathanallalmansi hundi ..	....	....	....
16 Jen hundi	....	....	....
17 Kullundi hundi	Wenlock Downs.	....	Athikal.
18 Kabbettumund hundi	Do.	..	Do.

Serial number and name of the pen. (1)	Reserve in which the pen is situated. (2)	Water-supply. (3)	Name of the village from which cattle resort to the pen. (4)
	Ootacamund South Range—cont.		
19 Kadamakkorai hundi	....	....	....
20 Kannaier hundi	Kundahs	....	Nanjanad.
21 Karthorai hundi No. I	....	....	....
22 Do. No. II	....	....	....
23 Kakathorai hundi	Kundahs	....	Keelkatti.
24 Kethar hundi	Porthi	....	Nanjanad.
25 Kudalkorai hundi	....	....	....
26 Mannadipoolu	Kundahs	....	Mullimalai.
27 Mudumari hundi	....	....	....
28 Nanjamath hundi	Kundahs	....	Ithalar.
29 Neethi	Wenlock Downs.	....	....
30 Nirmatha Kandi hundi	Do.	....	Nanjanad.
31 Omegudlu hundi	Do.	....	Yedakad.
32 Orakuthimund	Do.	....	Athikal.
33 Pampal	....	....	....
34 Sappagamara hundi	....	....	....
35 Thalakorai No. I	....	....	....
36 Do. No. II	....	....	....
37 Thurbardithorai hundi	Kundahs	....	Attubylu.
38 Uthamund	Wenlock Downs.	....	Nanjanad.
	Coonoor Range.		
1 Beemdoraipatti	Nilgiris eastern slopes reserved forest.	Moyar	Denad.
2 Godamadagapatti	Do.	Do.	Do.
3 Karadiguddaipatti	Do.	Do.	Do.
4 Mullimarapatti	Do.	Kukalthorai	Do.
5 Nedugalkombai	Melur slopes reserved forest.	....	....
6 Palamarappatti	Nilgiris eastern slopes reserve forest.	Kundah Moyar.	Manjakombai Kunshola.
7 Teppadaraipatti	Do.	Do.	Denad.
8 Thengumarapatti	Do.	Do.	Sullicode.
9 Thottapatti	Do.	Do.	Do.
10 Vagappanai	Vagapanai	Thattapallam	Kengarai.
	Sigur Range.		
1 Addaraipatti	Sigur reserved forest.	Kukalthorai	Bergani.
2 Alaimarapatti	Do.	Moyar	Denad.
3 Ambulurpatti	Do.	Kedarhalla	Orrmalai.
4 Arakadavupatti	Do.	Do.	....
5 Balanthopampatti	Do.	Sirupallam	Ebbanad.
6 Belaminpatti	Do.	Moyar	....
7 Bidrumalaipatti	Do.	Sigur river	Oormalai.
8 Boothapatti	Do.	Gundattipalar	Ebbanad.
9 Gokarepatti	Do.	Kedarhalla	Kunnur.
10 Guralpatti	Do.	Kodarhallaand Kokkaihalla.	Denad.
11 Gundabatti	Do.	Gundattipallam.	Do.
12 Hadamundpatti	Do.	Kukalthorai	Bergani.
13 Hosahatti	Do.	Kedarhalla	Denad.
14 Hunesemarapatti	Do.	Do.	Do.
15 Jagalikadavupatti	Do.	Sigur river	Kunnur.
16 Kalliadavupatti	Do.	Kallikadavu Pallam.	Hullatti.
17 Kalkadavupatti	Do.	Sigur river	Kunnur.
18 Kadjanpatti	Do.	Kedarhalla	Ebbanad.
19 Karemalapatti	Do.	Moyar	Denad.
20 Kodangupatti	Do.	Kodangupallam.	Kukalthorai.
21 Kurubalpatti	Do.	Kedarhalla	Denad.
22 Kumbarakadavupatti	Do.	Sirupallam	Ebbanad,
23 Maggalhatti	Do.	Kadavuhalla	....
24 Makkepatti	Do.	Kedarhalla	....
25 Malapurampatti	Do.	Do.	Thoraihalli and Oormalai.
26 Masipatti	Do.	Do.	Denad.
27 Mavukadavupatti	Do.	Sirurpallam	Ebbanad.
28 Manivanpatti	Do.	Sigur river	Odiyarhatti.

Serial number and name of the pen. (1)	Reserve in which the pen is situated. (2)	Water-supply. (3)	Name of the village from which cattle resort to the pen. (4)
Sigur Range—cont.			
29 Melpatti	Sigur reserved forest.	Kedarhalla	.. Chinnakunnur.
30 Mulekadavupatti	Do.	Kadarhalla	Denad.
31 Odagarapatti	Do.	Do.	.. Oormalai.
32 Pandikumbapatti	Do.	Do.	.. Kukalthorai.
33 Sirurpatti	Do.	Sivurpallam	.. Ebbanad.
34 Thattahallapatti	Do.	Thattahalla	.. Denad.
35 Thamidigittipatti	Do.	Kedarhalla	.. Kukalthorai.

APPENDIX VIII.

List of roads of the Forest Department in the Nilgiris Division.

Reference number.	*Name of road.*	*Name of reserve.*	*Length.* M.	F.	C.	*Cost.* RS.	A.	P.	*Year of construction.*	*Remarks.*
	Ootacamund North Range.									
14	Gass road	Aramby	1	4	6	..			1884–85	.. Metalled.
16	Gambles road	Do.	1	3	$5\frac{1}{2}$	2,245	0	0	1886	.. Do.
45	Parson's road	Do.	1	0	0	500	0	0	1897	.. Do.
15	Upper bridle path	Do.	1	1	5	..			1890–92	.. Unmetalled.
	Road in Block V compartments 13 and 16.	Do.	0	2	8	1,000	0	0	..	....
	Round road in Block VI	Do.	0	4	$6\frac{1}{2}$	341	0	0	1910	.. Unmetalled.
	Baikie road	Baikie		..		..			..	Do.
	Branch road in compartment 8 ..	Do.	0	0	8	..				Do.
50	Central Baikie road	Do.	0	6	0	117	0	0	1903–04 ..	Do.
	Branch road in compartment 6 ..	Do.	0	2	$1\frac{1}{2}$	..			..	Do.
82	Upper Baikie road	Do.	0	4	1	..			..	Do.
22	From Sigur Reserve Forest road to Brooklands plantations.	Brooklands ..	0	3	0	..			..	Do.
77	Cart road from Gudalur through Chemanguli plantations.	Chemanguli ..		..		..			..	Do.
30	Sheffield road from local fund road to Andy plantations.	Andy		..		..			..	Do.
814	Sheffield road from local fund road to Sheffield plantations.	Sheffield		..		..			..	Do.
28	Sheffield road from local fund road to Culli.	Chowghat Culli.		..		646	0	0	1889–90 ..	....
	Road from Marliamund to Balikal (via) Dharmatope.	Dharmatope ..	0	2	5	..			..	....
	Doddabetta observatory, Doddabetta path.	Doddabetta ..	1	4	0	..			..	....
	Doddabetta plantation inspection path.	Do. ..	1	0	0	..			..	....
	Madana cart-track	Madana	0	3	4	..			..	Unmetalled.
	Cart-track to join Governorshola.	Do.	0	2	0	90	0	0	1925–26 ..	Do.
	Marliamund bridle path	Marliamund and Aramby.	0	5	8	..			..	Do.
22	Marliamund Reserve Forest Inspection paths (3).	Marliamund ..		..		26	0	0	..	....
56	New road to Marliamund ..	Do. ..	0	5	2	40	0	0	1908–09 ..	Unmetalled.
20	From Mysore local fund road to Muthinad Reserve Forest.	Muthinad ..	0	7	0	..			..	Metalled.
87	Extension to Muthinad cart-track through compartment 7.	Do.	0	1	$9\frac{3}{4}$	320	0	0	1887–88 ..	Do.
74	Road to Snowdon	Snowdon ..	0	6	5	1,002	8	7	1917–18 ..	Unmetalled.
5	Jogo's road	Cairnhill ..	3	0	1	2,095	0	0	1886–87 ..	Cairn Hill Reserved forest metalled.
9	Circular road	Do.	0	7	7	599	0	0	1884–85 ..	Unmetalled.
11	Junction road	Do.	0	2	1	..			..	Do.
13	Brandis road	Do.	0	5	$8\frac{1}{2}$	289	0	0	1915–16 ..	Metalled.
65	College road	Do.	1	1	1	3,043	5	0	1916 ..	Do.
	Manjanakorai bridle path ..	Do.		..		35	0	0	1889–90 ..	Unmetalled.
	(Road from Crian hill block II) Grant duff road.	Do.		..		50	0	0	1915–16 ..	....
	Rugby road	Do.	0	4	$7\frac{1}{2}$	..			..	....
	Bridle path from circular road to Grant duff road.	Do.	1	3	0	260	10	8	1913 ..	Unmetalled.
	Bridle path from compartments 1, 6, 7, 10 and 11 of Block II.	Do.	0	5	6	24	11	0	1916 ..	Do.
	Avalanche—Sispara bridle path.	Do.	18	0	0	..			..	Transferred from the control of Bikkatti Panchayat Board in G.O. No. 323, dated 25th May 1947 to the Forest Department.

Reference number.	Name of road.	Name of reserve.	Length. M. F. C.	Cost. RS. A. P.	Year of construction.	Remarks.
	Coonoor Range.					
	Bandyshola road	Bandyshola ..	0 7 8	350 0 0	1923–24 ..	Metalled in part.
47	A New road in Blackbridge ..	Black bridge ..	..	22 0 0	1901–02 ..	....
71	Black house road	Bleak house ..	1 3 0	1,193 14 0	1916–17 ..	Metalled.
31	Old forest road to Coonoor ..	Coonoor Peak ..	0 5 6	130 0 0	1886 ..	Do.
36	Teneriffee road	Do. ..	0 4 3½	..	..	Do.
38	Grass road	Do. ..	0 7 5	..	..	Do.
37	Ridge road	Do. ..	0 2 3	..	..	Unmetalled.
72	College upper road	Do. ..	1 0 1½	3,661 4 0	1916–17 ..	Metalled.
72A	College Middle road	Do. ..	0 6 3	..	..	Unmetalled.
	College Main road	Do. ..	1 1 0	3,312 8 11	1919–20 ..	Do.
72B	College lower road	Do. ..	0 6 6	..	..	Do.
	Lower road lying in tea estates ..	Do. ..	0 6 9	696 0 0	1916–17 ..	Metalled.
	College main and middle roads ..	Do. ..	0 2 0	250 0 0	1916–17 ..	Do.
35	Teneriffee bridle path	Do. ..	0 5 9½	54 0 0	1885–86 ..	Unmetalled.
33	Jago's road through compartments 38, 39 and 40.	Do. ..	1 0 9	130 0 0	1886 ..	Do.
	Kodamalai patta road	Do. ..	0 2 1	250 0 0	1916–17 ..	Metalled.
	Grass road path between grass and college main road.	Do. ..	0 2 2	396 0 0	1917–18 ..	Unmetalled.
	Forest bridle path	Do.	0 6 3½	..	1886–87 ..	Do.
	Tea estate road between the college main road and upper road.	Do. ..	0 2 0	250 0 0	1917–18 ..	Metalled.
	Ketti Plantation road	Ketti	0 4 0	300 0 0	1910 ..	....
57	Road to Kodanad Resth-ouse ..	Kodanad ..	0 2 8	200 0 0	1910–11 ..	Unmetalled.
86	Approach road from Kodanad rest-house to stalles.	Do. ..	0 3 8	81 0 0	1925–26 ..	Do.
40	Longwood road	Longwood ..	1 4 0	937 0 0	1910–11 ..	Do.
68	Bridle path in Longwood Reserved Forest.	Do. ..	..	43 0 0	1910–11 ..	Do.
	Longwood rest house to Kerbetta.	Do. ..	0 2 0	..	..	Do.
39	Rallia road	Rallia	1 2 0	..	..	Do.
73	Road from Rallia to Newman ..	Do. ..	0 7 4	166 10 2	1916–17 ..	Do.
	Peat bog Rallia road	Do. ..	1 2 0	..	..	
	Rallia Bandumi road	Do. ..	2 3 0	2,772 0 0	1931–32 ..	Metalled.
	Inspection path from Medanad to Kodanad.	Do. ..	0 3 0	..	..	....
	Forest Lodge road	Sim's Park ..	0 2 0	..	..	....
	Siglur Range.					
	Masingudi Bokkapuram Temple road.	Averhalla ..	3 0 0	99 0 0	1930 ..	Unmetalled.
58A	Bridle along the fire line in West Moyar.	Moyar	10 0 0	284 0 0	1910–11 ..	Metalled.
61	Bridle path in Moyar Reserved Forest.	Do.	3 1 5	438 0 0	1912 ..	Do.
63	Bridle path along the fire line in North Moyar Reserved Forest and a footpath from the top of Basai to Moyar Reserved Forest.	Do.	7 0 0	776 0 0	1912–13 ..	....
78	Sigur bridge—Anaikalli cart track.	Sigur	3 0 0	..	..	Metalled.
76	Hosur-Anaikatti cart track ..	Do.	5 4 0	..	..	Do.
	Anaikatti-Sirur cart track ..	Do.	4 4 0	454 0 0	..	Unmetalled.
77	Branch road from Hosur Anaikatti road to Anaikatti.	Do.	1 0 0	..	..	....
84C	Teppakadu to old Elephant Camp.	Moyar	0 0 5	..	..	Unmetalled.
1	Road from Benne to Teppakadu Reserved Forest.	Benne and Mudumalai.	14 0 0	..	About 60 years age.	Do.
3	Peepigaddai to Jaldhansi in Benne Reserved Forest.	Do.	1 2 2½	..	Do.	Do.
84B	Kothimadu road from Mudumalai Mukkatti road to district boundary.	Do.	1 6 0	..	..	Do.
6	Road from Benne to Mukkatti on Sultan's Battery road.	Do.	3 7 0	612 0 0	1892	Do.
69	Mudumalai Karaboi bridle path *via* Doddakatti.	Doddakatti and Mudumalai.	0 2 9	1,778 15 7	1916–17	Do.
79	Bridle path from Homeshatti to Mudumalai.	Do.	8 6 0	1,571 11 1	1916–18	Do.
81	Margon road	Do.	4 3 0	..	..	....
84D	Cart track to upper Kargudi Subordinate line depot site.	Mudumalai ..	0 2 5	..	..	Unmetalled.
2	Belluramargudi to Mysore road near Kakkanhalla from Mudumalai-Teppakadu road.	Do. ..	3 4 0	..	About 6 years age.	Do.
4	From southern boundary of Church estate to Siriya Guggala on Mudumala Benne Road.	Do. ..	3 3 0	615 0 0	Do.	Do.
48	Road to Mudumalai Station ..	Do. ..	0 1 1	..	1890–91 ..	Do.
49	Road to Benne Nursery to the Rest house.	Benne	0 3 8	55 0 0	1901–02 ..	Do.
60	Road to Kargudy colony ..	Mudumalai ..	1 2 0	2,257 0 0	1912 ..	Metalled.

Reference number.	*Name of road.*	*Name of reserve.*	*Length.*			*Cost of construction.*			*Year of construction.*	*Remarks.*
			M.	F.	C.	RS.	A.	P.		
		Sigur Range—cont.								
63	Thorapalli Mudumalai Road ..	Mudumalai ..	6	3	0	7,854	0	0	1916 ..	3 miles 3 furlongs metalled.
75	Road from Kargudi main road to Range Officers Quarters.	Do. ..	0	3	0	299	9	7	1916–17 ..	Metalled.
83	Road to Ram-site from upper Kargudi along 1921 college path.	Do. ..	0	3	8½	412	2	0	1922–23 ..	Unmetalled.
84	Cart track from Benne Mukketti Road.	Benne and Mudumalai.	0	6	3	201	7	0	1924–25 ..	Do.
	Kargudi Mudumalai Road ..	Mudumalai ..	4	4	0	..			..	Do.
84A	Road from Kargudi Mudumalai road to the Rest House at Kargudi.	Do. ..	0	4	5	..			..	Do.
84B	Kotimodduku road from Mudumalai Mukkatti road to District boundary.	Mudumalai and Benne.	1	6	0	..			..	Do.

APPENDIX IX.

List of buildings of the Forest Department in the Nilgiris Division.

Number and locality.	*Description.*	*Cost of building.*			*Value of site.*			*Total.*			*Date of construction.*
		RS.	A.	P.	RS.	A.	P.	RS.	A.	P.	
	Ootacamund South Range.										
1 Bangithappal ..	Rest house with servants' quarters and latrine.	3,371	6	2	..			3,371	6	2	1938–39
2 Kokkothorai ..	Inspection shed	978	12	9	..			978	12	9	1936–37.
3 Nilgiris Peak ..	Do.	1,063	8	0	..			1,063	8	0	1936–37.
4 Avalanche	Traveller's bungalow with all equipments.	4,139	0	0	48	0	0	4,197	0	0	Not known.

Transferred from the Nilgiris Board to the Forest Department on 8th October 1947 under G.O. Ms. No. 2180, Development, dated 15th May 1947.

5 Cairnhill	Forest Guards shed	1,290	0	0	10	0	0	3,000	0	0	1880.
6 Ithalar	Do.	921	0	0	5	0	0	926	0	0	1924.
7 Bikkatti	Do.	1,070	0	0	6	0	0	1,076	0	0	1926.
8 Nanjanad	Do.	1,037	0	0	4	8	0	1,041	8	0	1925.
9 Naduvattam ..	Do.	Transferred from P.W.D. to Forest Department with effect from 1st April 1949 in G.O. Ms. No. 2091, Development, dated 9th May 1951 for Rs. 629.									
10 Kokkothorai ..	Do.	1,262	0	0	..			1,262	0	0	1942 for two Forest Guards.
11 Avalanche	Forester's quarters	890	0	0	6	0	0	896	0	0	1941 now occupied by Forest Guards.
	Forest Colony, Bishop Down.										
11-A Bishopdown Block 2 houses.	Clerks' quarters, I class	8,225	0	0							
	Cost of installation	254	0	0	130	0	0	8,624	0	0	1928.
	Water-supply	15	0	0							
12 Bishopdown Block II, 2 houses.	Clerks' quarters, II class	5,344	0	0							
	Electric installation	164	0	0							
	Water-supply	10	0	0	90	0	0	6,028	0	0	1928.
	Cost of glazing	420	0	0							
13 Block III, 3 houses	Clerks' houses, III class	6,522	0	0							
	Water supply	15	0	0							
	Electric installation	246	0	0	109	0	0	7,491	0	0	1928.
	Open verandah	599	0								
14 Block IV, 2 houses.	Clerks' houses, III class	4,364	8	0							
	Water-supply and sanitary arrangements.	9	8	0							
	Electric installation	165	0	0	73	8	0	5,012	13	0	1928.
	Open verandah	400	5	0							
15 Block V	Two houses, III class	4,364	8	0							
	Water-supply and sanitary arrangements.	9	8	0							
	Electric installation	165	0	0	73	8	0	5,012	13	0	1928.
	Open verandah	400	5	0							
16 Block VI	Two houses, clerks' quarters, III class ..	4,363	8	0							
	Water-supply and sanitary arrangements.	9	8	0							
	Electric installation	149	0	0	73	8	0	4,596	0	0	1928.
17 Block VII	Two houses, clerks' quarters, III class ..	4,364	8	0							
	Water-supply and sanitary arrangements.	9	8	0							
	Electric installation	148	0	0	73	8	0	4,596	0	0	1928.
18 Block VIII ..	Two houses, clerks' quarters, III class ..	4,364	8	0							
	Water supply and sanitary arrangements.	9	8	0							
	Electric installation	148	0	0	73	8	0	4,595	8	0	1928.
19 Block IX	Two houses, clerks' quarters, III class ..	4,348	8	0							
	Water-supply and sanitary arrangements.	9	8	0							
	Electric installation	73	8	0	73	8	0	4,579	0	0	1928.

Number and locality.	*Description.*	*Cost of building.*	*Value of site.*	*Total.*	*Date of construction.*
		RS. A. P.	RS. A. P.	RS. A. P.	
	Forest Colony, Bishop Down—cont.				
20 Block X	Five houses, Peon's lines..	5,207 0 0	135 9 0	5,427 9 0	1928.
	Water-supply, etc.	13 0 0			
	Electric installation	72 8 0			
21 Block XI	Five houses, Peon's lines	5,202 0 0	135 9 0	5,422 9 0	1928.
	Water-supply, etc.	13 0 0			
	Electric installation	72 0 0			
22 Block XII	Five houses, Peon's lines..	5,207 0 0	135 9 0	4,437 9 0	1928.
	Water-supply, etc.	13 0 0			
	Electric installation	72 0 0			
23 Sweeper's shed ..	Sweeper's shed for the use of the sweepers for permanently engaged for the sweeping work.	1,443 0 0	..	1,443 0 0	1947.
24 Ootacamund Fuel depot.	Near Shantivijaya Girls' High School ..	2,050 0 0	..	2,050 0 0	1910–11.
	Transferred to the Revenue Department—vide G.O. Ms. No. 1800, Revenue, dated 8th September 1944 for assignment to Shanti Vijaya Girls' High School for extension of buildings, R.Dis. No. 863 of 1942.				
25 Ootacamund Fuel depot.	Opposite to goods shed to Ootacamund Railway Station.	3,700 0 0	..	3,700 0 0	1945.
	Newly constructed and handed over to Forest Department by the Secretary, Girls' High School in place of old one.				
26 Baikie Drier ..	Not known	..	..	..	Not known.
	Ootacamund North Range.				
1 Bikkapathimund ..	Rest house at Bikkapathimund ..	2,297 0 0	..	2,297 0 0	1909–10.
	Out houses attached to old house ..	350 0 0	..	350 0 0	1909–10.
2 Aramby	Principal's hut	3,701 0 0	..	3,701 0 0	1923.
	Senior Instructor's quarters	1,910 0 0	..	1,910 0 0	1923.
	Improvements done in Principal's quarters in 1943–44.	568 0 0	..	568 0 0	1942–44.
	Stable	529 0 0	..	529 0 0	1942–44.
	Motor shed	529 0 0	..	529 0 0	1942–44.
	Servants quarters	1,066 0 0	..	1,066 0 0	1942–44.
3 Honnathalai ..	Pyrethrum drier	5,341 8 5	..	5,341 8 5	1944–45.
	For drying pyrethrum flowers	342 3 6	..	342 3 6	1944–45.
	Masonry structure attached to the drier with platform.				
4 Aramby	Forest Guards shed	110 0 0	10 0 0	120 0 0	1880.
5 Doddabetta ..	Do.	310 0 0	6 0 0	316 0 0	1880.
6 Snowdon	Do.	150 0 0	10 0 0	160 0 0	1898.
7 Pykara	Do.	310 0 0	2 0 0	312 0 0	1912.
8 Sholur	Do.	894 0 0	3 12 0	897 12 0	1942 for 2 Forest Guards.
9 Bikkapathimund ..	Do.	650 0 0	12 0 0	662 0 0	1909–10 now occupied by the Forest Guards.
10 Chinna Coonoor ..	Do.	87 0 0	3 0 0	90 0 0	1898.
	Written off in Conservators No. 267/48, dated 29th January 1948 *vide* this Office No. 2723/46.				
11 Do. ..	Now Forest Guard's shed	The construction of a new forest Guards shed is almost complete. (1953).			
12 Aramby	Foresters quarters	1,800 0 0	..	1,800 0 0	Written off in Conservator's Ref. No. 2888/43, dated 17th November 1943.
13 Honnathalai ..	Subordinate's shed	2,088 0 0	..	2,088 0 0	1944–45.
	Subordinate's kitchen	364 0 0	..	364 0 0	
	Part occupied by the Foresters and part unused.				
14 Governor's shola, Hecuba.	Hutments for coolies 36 sets of rooms and	13,677 6 0	..	13,677 6 0	1943.
	latrine 2 blocks of 15 rooms.	945 0 0	..	945 0 0	1943.
15 Rees corner ..	26 sets of rooms	7,419 10 0	..	7,419 10 0	1943.
	Latrines 2 blocks of 10 rooms	566 0 0	..	566 0 0	1943.
16 Muthinad	Fifteen sets of rooms	5,755 0 0	..	5,755 0 0	1943.
	Latrines 12 rooms	892 0 0	..	892 0 0	1943.
17 Black Bridge ..	Sixteen sets of rooms	5,760 0 0	..	5,760 0 0	1943.
	Water cistern for coolies constructed for the coolies of Pyrethrum department.	280 0 0	..	280 0 0	1943.
	Coonoor Range.				
1 Kodanad	Rest house at Kodanad	1,800 0 0	200 0 0	2,000 0 0	1907.
	Out house and stables	216 0 0	..	216 0 0	1902.
2 Kotagiri	Long Wood rest house .. .. .. Including the cost of dismantled M.F.C. materials.	1,360 0 0	..	1,360 0 0	1941–42.
	Thatched motor shed attache to the rest house.	44 0 0		44 0 0	1941–42

Number and locality.	Description.	Cost of building. RS. A. P.	Value of site. RS. A. P.	Total. RS. A. P.	Date of construction.
	Coonoor Range—cont.				
	Fallen down and written off in Conservator's D. Dis. No. 3796/48, dated 14th December 1948.				
3 Bandyshola ..	.. Bandyshola Rest House as classified as "C" class rest house in Collector's D.Dis. No. 362/46, dated 9th May 1946.	1,316 0 0	..	1,316 0 0	1922–23.
	District Forest Officer's No. 29-8-R of 1945, Senior Instructor's quarters M.C.C. shed, now garage.	425 0 0	..	425 0 0	1922–23.
	Sweeper's room	400 0 0		400 0 0	1922–23.
	Servant's quarters	850 0 0		850 0 0	1922–23.
4 Bandyshola	.. Forester's shed "A"	1,124 0 0	55 0 0	1,179 0 0	1914.
	Do. "B"	617 0 0	55 0 0	672 0 0	1914.
	Do. "C"	617 0 0	55 0 0	672 0 0	1914.
	Do. "D"	617 0 0	55 0 0	672 0 0	1914.
5 Sim's park ..	.. Range Officer's quarters	2,214 0 0	500 0 0	2,714 0 0	1906.
	Range clerk's quarters	858 12 9	..	858 12 9	1941–42.
	Including the cost of dismantled M.F.C. materials.				
6 Kotagiri ..	.. Forester's quarters at Kotagiri	5,195 0 0	..	5,195 0 0	1947 Sanctioned in Chief Conservator's No. 35, dated 18th January 1946.
7 Ketti ..	.. Plantation Forest Guard's shed	100 0 0	..	100 0 0	1947.
8 Hulikkal ..	.. Do.	750 0 0	25 0 0	775 0 0	1925.
9 Benhope ..	.. Do.	755 0 0	26 0 0	781 0 0	1947.
10 Kolakombai	.. Do.	848 0 0	25 0 0	873 0 0	1927.
11 Kengarai ..	.. Do.	696 0 0	25 0 0	721 0 0	1926.
12 Kunjappanai	.. Do.	700 0 0	25 0 0	725 0 0	1926.
13 Konakorai ..	.. Do.	699 0 0	25 0 0	724 0 0	1927–28.
14 Kotagiri ..	.. Do.	Transferred from P.W.D. with effect from 1st April 1947 in G.O. Ms. No. 2091, dated 9th May 1951, District Forest Officer's Ref. No. R.Ds. No. 909/50 for Rs. 864 for F. G. Longwood.			
15 Kodanad ..	.. Forest Guard's shed	370 0 0	..	370 0 0	1911.
16 Aracode ..	.. Do.	100 0 0	..	100 0 0	1916–17.
	Mudumalai Range.				
1 Kargudy ..	.. Rest House, Kargudy	4,848 7 0	12 8 0	4,816 15 0	1912.
	Out house and stables	938 0 0	..	938 0 0	1912.
2 Mudumalai ..	.. Rest house, Mudumalai	680 5 11	7 8 0	687 13 11	1915.
	Sanction is accorded by the Conservator to dismantle in his Ref. D.Dis. No. 1187/47, dated 17th April 1949.				
3 Benne ..	.. Rest house}	1,023 4 0	2 8 0	1,025 12 0	1924.
4 Mudumalai ..	.. Games hut	Taken charge on 15th March 1953 (not known).			
5 Kargudy ..	.. Range officer's quarters	5,375 0 0	12 8 0	5,387 8 0	1923–24.
6 Benne ..	.. Ranger's halting place	475 0 0	28 0 0	503 0 0	1924.
7 Kargudy ..	.. Old depot-keeper's building at Kargudy with kitchen.	1,304 0 0	12 8 0	1,316 8 0	1915.
8 Do. ..	.. Guard's line, lower Kargudy	3,055 0 0	..	3,055 0 0	22nd October 1951.
	Transferred from Highways Department to Forest Department, formerly known as mazdoors' lines, between miles 39/5 and 39/6 on the Ootcamund-Mysore road. Taken over charge from Highways on 22nd October 1951 in G.O. Ms. No. 4656.				
9 Kargudy ..	.. Kargudy old subordinates'—				
	Quarters I	501 0 0	..	501 0 0	1914.
	Quarters II	501 0 0	..	501 0 0	1914.
	Quarters III	501 0 0	..	501 0 0	1914.
10 Do. ..	.. New subordinate quarters I	1,023 2 0	..	1,023 2 0	1924.
	Do. II	1,023 2 0	..	1,023 2 0	1924.
	Do. III	1,023 2 0	..	1,023 2 0	1924.
	Do. IV	1,023 2 0	..	1,023 2 0	1924.
11 Do. ..	.. Temporary forester's quarters, Kargudy.	732 0 0	..	732 0 0	1951–52.
12 Do.	.. Temporary Forest Guard's quarters, Kargudy, 2 sets.	Construction during 195			
13 Do. ..	.. Peons quarters re-construction of I.R.C. quarters, and kitchen.	Do.			
14 Teppakadu	.. Forest Guards' quarters	732 0 0	..	732 0 0	1933–34. 1934–35.
	Sigur Range.				
1 Masinagudy..	.. Range Officer's quarters and outhouse.	3,218 0 0	50 0 0	3,268 0 0	1919—1929.
2 Do.	.. Sandalwood depot shed	166 0 0	50 0 0	216 0 0	1931–32.
	The present Range Office, Masinagudy.				
3 Do.	.. Range clerk's quarters room	743 0 0	50 0 0	793 0 0	1930.
4 Do.	.. Forester's quarters	743 0 0	50 0 0	793 0 0	1930.
5 Do.	.. Watcher's shed	372 0 0	50 0 0	422 0 0	1930.

APPENDIX X.

List of Wattle plantations in the Nilgiris Division (up to 1948).

Serial number.	*Number in the map.*	*Locality.*	*Area in acres.*	*Initial cost.* RS. A. P.	*Espacement.* FEET.
		(Old) Ootacamund Range.			
	1939–40				
1	9	Ouchterlony Reserved Forest (Non-tuckle) ..	2·00	157 13 0	6 × 6
2	14	Pechelbettu Reserved Forest (Non-tuckle) ..	1·00	150 0 0	6 × 6
3	15	Porthimund Reserved Forest (Non-tuckle) ..	2·00	189 0 0	6 × 6
4	16	Karpagam Reserved Forest (Non-tuckle) ..	4·00	508 12 0	6 × 6
5	51	Doddabetta Reserved Forest (Non-tuckle) ..	1·50	..	..
6	51-A	Do. ..	1·50	..	9 × 9
7	85	Kundah Reserved Forest Kokothorai (Non-tuckle).	4·00 }	570 15 0	..
8	86	Do.	1·00 }		
9	96	Kundah Avalanche (Non-tuckle)	3·00	356 0 0	6 × 6
			20·00		
	1940–41				
1	17	Karpagam (Non-tuckle)	5·00	387 4 6	6 × 6
2	18	Do.	5·00	397 7 6	6 × 6
3	87	Kundah (Kokothorai Non-tuckle)	5·00 }	206 13 6	8 × 8½
4	88	Do.	5·00 }		
			20·00		
	1941–42				
1	63	Silhalla (Non-tuckle)	10·00	288 15 0	6 × 6
2	89	Kundah (Kokothorai Non-tuckle)	3·60 }	232 13 0	4½ × 4½
3	90	Do.	1·40 }		
	1942–43				
1	24	Fairlawns (Cairnhill) Tuckle ..	5·90	81 1 8	12 × 12
2	25	Do.	4·90	54 6 6	12 × 12
3	26	Cairnhill Tuckle	3·03	51 9 0	12 × 12
4	29	Lovedale Tuckle	18·80	204 2 0	12 × 12
5	30	Do.	3·80	41 3 0	12 × 12
6	34	Marlimund (Snowdon) Tuckle	7·15	76 13 0	12 × 12
7	91	Kundah (Kokothorai) Non-tuckle	27·00	302 12 0	9 × 9
8	65	Kothibennu (Kilur) Tuckle sowing	1·00	54 4 0	12 × 12
			71·08	Vide plantation in 1943–44 also.	
	1943–44				
1	36	Marlimund (Snowdon) Tuckle	2·30	24 11 0	12 × 12
2	37	Darmathope Tuckle	2·75	26 0 0	12 × 12
3	45	Aramby (Aramby) Tuckle	4·60	119 10 6	12 × 12
4	46	Do.	1·00	19 9 0	12 × 12
5	55	Araihatty (Ithalar) Tuckle	4·00	35 8 0	12 × 12
6	82	Edakadu (Bikkatti) Tuckle	8·00 }	30 6 0	12 × 12
7	83	Do.	1·60 }		
8	92	Kundah (Kokothorai) Non-tuckle	21·00	937 9 0	6 × 6
9	65	Kothibennu (Kilur) Tuckle	8·50	Out of 9·50 acres 1·00 acre was formed in 1942–43 and 8·50 in 1943.	
			54·15		
	1944–45				
1	27	Fairlawns (Cairnhill) Tuckle	4·80	7 4 0	12 × 12
2	28	Do.	4·00	9 6 0	12 × 12
3	32	Lovedale Tuckle	1·30	..	12 × 12
4	39	Pagalmund (Snowdon) Non-tuckle	5·00	478 8 0	6 × 6
5	66	Kothibennu (Kilur) Tuckle	1·90	13 0 0	12 × 12
6	67	Do.	3·30	24 8 0	12 × 12
7	71	Thalakad Tuckle	2·10	13 8 0	12 × 12
8	72	Do.	8·90	70 12 0	12 × 12
9	78	Maryland (Kilur) Tuckle	1·90	13 0 0	12 × 12
			33·20		
	1945–46				
1	35	Dharmathope (Snowdon) Tuckle	2·20	13 12 0	12 × 12
2	54	Iruporai (Ithalar) Tuckle	3·50	24 6 0	12 × 12
3	80	Vegunthabetta Reserve Forest (Kilur) Tuckle.	3·60	30 12 0	12 × 12
4	84	Kundah (Bikkatti) Tuckle	4·00	15 0 0	12 × 12
5	..	Kaguchi (Bikkapatti) Tuckle	1·50	12 0 0	12 × 12
			14·80		
	1946–47				
1	33	Cairnhill (Cairnhill) Tuckle	1·40	8 14 0	12 × 12
2	38	Dharmathope (Snowdon) Tuckle	5·00	10 6 0	12 × 12
3	40	Pagulmund Tuckle	4·50	5 14 0	12 × 12
4	41	Dharmathope Tuckle	1·20	2 5 0	12 × 12
5	44	Do.	1·30	1 14 0	12 × 12
6	48	Griamore (Doddabetta) Tuckle	1·00	6 10 0	12 × 12
7	56	Araihatty (Ithalar) Tuckle	1·60	16 4 0	12 × 12
8	57	Do.	3·70	38 12 0	12 × 12

Serial number.	*Number in the map.*	*Locality.*	*Area in acres.*	*Initial cost.*	*Espacement.*
				RS. A. P.	FEET.
	1946–47—*cont.*	***(Old) Ootacamund Range*—cont.**			
9	58	Ithalar Tuckle	2·10	34 10 0	9 × 9
10	59	Do.	1·50	9 8 0	12 × 12
11	60	Do.	4·00	36 12 0	12 × 12
12	61	Do.	2·10	20 0 0	12 × 12
13	62	Do.	2·00	32 6 0	9 × 9
14	68	Kothibennu (Kilur) Tuckle	6·30	48 15 6	12 × 12
15	69	Do.	1·25	7 8 0	12 × 12
16	70	Do.	1·50	8 8 0	12 × 12
17	73	Thalakad Tuckle	3·80	32 0 0	12 × 12
18	74	Do.	5·60	64 0 0	12 × 12
19	75	Do.	5·60	58 9 6	12 × 12
20	76	Do.	2·70	18 0 0	12 × 12
21	77	Do.	2·70	18 0 0	12 × 12
22	79	Birgunda Tuckle	3·10	20 8 0	12 × 12
23	81	Vegunthabetta Tuckle	5·00	58 10 0	12 × 12
24	95	Ketti Unreserve Non-tuckle	15·00	904 5 0	12 × 12
25	..	Sandynullah Reserve Forest Non-tuckle ..	3·00	161 4 0	12 × 12
			86·95		
	1947–48				
1	..	Lovedale Reserved Forest Tuckle	1·30	..	12 × 12
2	..	Cairnhill Reserved Forest Tuckle	1·30	..	12 × 12
3	..	Elkhill Tuckle	1·60	..	12 × 12
4	..	Do.	0·56	..	12 × 12
5	..	Fairlawns Tuckle	1·95	..	12 × 12
6	..	Pagulmund Reserved Forest Tuckle	2·50	..	12 × 12
7	..	Dharmathope Tuckle	7·20	..	12 × 12
8	..	Do.	2·30	..	12 × 12
9	..	Doddabetta Tuckle	2·00	..	12 × 12
10	..	Do.	5·56	..	12 × 12
11	..	Kodappamund Tuckle	3·00	..	12 × 12
12	..	Aramby addition Reserve Forest Tuckle ..	2·00	..	12 × 12
13	..	Naduvattam Reserve Forest Tuckle	2·00	..	12 × 12
14	..	Wenlock Downs Reserve Forest Tuckle ..	6·20	..	12 × 12
15	..	Wenlock Downs Reserve Forest Tuckle ..	26·50	..	12 × 12
16	..	Thalakad Tuckle	2·90	..	12 × 12
17	..	Kothibennu Reserved Forest Tuckle ..	11·00	..	12 × 12
18	..	Do.	2·80	..	12 × 12
19	..	Maryland Reserved Forest Tuckle	2·20	..	12 × 12
20	..	Do.	6·10	..	12 × 12
21	..	Do.	1·30	..	12 × 12
22	..	Melur West Tuckle	1·20	..	12 × 12
23	..	Do.	1·33	..	12 × 12
24	..	Ithalar Reserve Forest Tuckle	6·60	..	12 × 12
25	..	Do.	1·90	..	12 × 12
26	..	Do.	1·75	..	12 × 12
27	..	Araihatty Tuckle	0·50	..	12 × 12
28	..	Do.	1·50	..	12 × 12
29	..	Do.	2·80	..	12 × 12
30	..	Ketti Unreserve Non-tuckle	5·00	..	9 × 9
			115·85		
		Coonoor Range.			
	1939–40				
1	22	Huppatti (Kodanad) Non-tuckle	3·00	307 8 0 39 0 0	6 × 6 Tending. This includes for 1938 and 1939–40 areas.
		1938	1·00	acre.	
		1939	1·00	,,	
		1940	1·00	,,	
			3·00		
	1941–42				
1	7	Gudakkalhalla Non-tuckle	9·43 4·57	970 11 5	3 × 12
			14·00	This includes expenditure for three years planting (vide areas planted in 1942–43).	
	1942–43				
1	9	Gudakkalhalla Non-tuckle	1·88 1·60	..	6 × 12
2	11 12	Sullicode Block II. Tuckle .. .. .. Do.	10·80 8·60	233 12 0	6 × 12 3 × 3 6 × 6 12 × 12
3	19	Curzon valley Non-tuckle	29·75	235 2 0	12 × 12
			52·63		

Serial number.	*Number in the map.*	*Locality.*	*Area in acres.*	*Initial cost.*	*Espacement.*
		Coonoor Range—cont.		RS. A. P.	FEET.
	1943–44				
1	1	Simspark Reserved Forest II Tuckle.. ..	0·90	3 0 0	12 × 12
2	2	Mokkai Reserved Forest Tuckle	3·00	12 0 0	12 × 12
3	3	Gudakkalhalla Reserved Forest Non-tuckle ..	2·80 } 3·00 }	For particulars of expenditure vide 1941–42 plantation.	6 × 12
4	17	Konakorai Reserved Forest Tuckle	5·00	5 0 0	12 × 12
5	20	Avarahalla Reserved Forest Non-tuckle ..	18·25	472 8 0	12 × 12
6	25	Kulear Non-tuckle	16·50	266 2 0	6 × 6
			49·45		
	1944–45				
1	10	Sullicode Block II Reserved Forest Tuckle ..	7·50	16 0 0	12 × 12
2	14	Curzon Valley No. III Reserved Forest Non-tuckle.	25·00	456 2 0	9 × 12
3	15	Do.	3·50	7 0 0	12 × 12
			36·00		
	1945–46				
1	21	Doddabetta No. I Reserved Forest	18·50	439 15 0	9 × 9
2	26 & 27	Pillur Reserved Forest (Pillur shola Reserved Forest) Non-tuckle.	6·00	48 0 0	4½ × 4½ 12 × 12
3	34	Osatti Reserved Forest Tuckle	2·00	5 0 0	9 × 9
			26·50		
	1946–47				
1	5	Rajeby Reserved Forest Tuckle	2·90	5 0 0	12 × 12
2	6	Longwood addition II Reserved Forest Tuckle.	2·25	3 8 0	12 × 12
3	13	Kunshola Reserved Forest Tuckle	9·20	15 0 0	12 × 12
4	16	Kanneriodia Reserved Forest Tuckle.. ..	1·60	1 0 0	12 × 12
5	18	Sundatti Reserved Forest Tuckle	4·27	2 0 0	12 × 12
6	28	Adigaratti Reserved Forest Tuckle	1·80	6 12 0	12 × 12
7	29	Koderi Reserved Forest Tuckle	3·40	12 8 0	12 × 12
8	30	Doddanni Reserved Forest Tuckle	2·70	10 0 0	12 × 12
9	31	Osatti Reserved Forest Tuckle	2·40	9 0 0	12 × 12
10	32	Do.	1·70	7 2 0	12 × 12
11	33	Do.	2·80	10 8 0	12 × 12
12	35	Kilur Reserved Forest Tuckle.. ..	2·75	11 0 0	12 × 12
13	36	Ketti valley Reserved Forest Tuckle.. ..	1·90	7 2 0	12 × 12
			39·67		
	1947–48				
1	..	Pembroke Reserved Forest Tuckle	1·30 }	90 0 0 }	12 × 12
2	..	Osatti Reserve Forest Tuckle	3·20		12 × 12
3	..	Do.	1·80		12 × 12
4	..	Adigaratti Reserve Forest Tuckle	2·80		12 × 12
5	..	Sampangi Reserve Forest Tuckle	2·90		12 × 12
6	..	Osatti Reserve Forest Tuckle	2·14		12 × 12
7	..	Do.	1·50		12 × 12
8	..	Do.	5·50		12 × 12
9	..	Do.	4·00		12 × 12
10	..	Do.	1·18		12 × 12
11	..	Neyyatti Reserve Forest Tuckle	0·80		12 × 12
12	..	Osatti Reserve Forest Tuckle	2·50 }		12 × 12
13	..	Nedugula Reserve Forest Tuckle	7·20	24 0 0	
14	..	Thambrakadamba Reserve Forest Tuckle ..	4·00	22 0 0	
			40·82		

APPENDIX XI.

List of officers who held charge of the Nilgiris Forest Division from 1st April 1928.

	Name.	*From*	*To*
1	W. G. Dyson	....	1st April 1928.
2	M. F. Bridge	2nd April 1928 ..	11th March 1932.
3	C. J. Van Haften	12th March 1932 ..	13th May 1932.
4	R. S. Browne..	14th May 1932 ..	9th December 1936.
5	G. C. Robinson	10th December 1936 ..	12th February 1937.
6	F. D. Ardagh	13th February 1937 ..	20th February 1939.
7	C. R. F. Williams	21st February 1939 ..	2nd April 1940.
8	P. W. Davis	3rd April 1940 ..	28th February 1935.
9	H. G. Hicks	1st March 1945 ..	15th August 1947.
10	K. Shankaranarayana Rao ..	16th August 1947 ..	30th October 1947.
11	B. J. Singh	31st October 1947 ..	10th May 1948.
12	K. Shankaranarayana Rao ..	11th May 1948 ..	25th May 1948.
13	E. A. Lasrado	26th May 1948 ..	23rd December 1949.
14	S. M. A. Aslan	24th December 1949 ..	1st April 1950.
15	N. N. Ayyanna	2nd April 1950 ..	28th May 1951.
16	D. V. Nagaratnam	29th May 1951 ..	8th June 1953.
17	D. K. Dey	9th June 1953 ..	....

APPENDIX XII.

Compartment histories—The Bluegum Working Circle.

ARAMBY.

Area.—The total area is 379·4 acres.

Settlement.—Notified as reserved forest in G.O. No. 1407, Revenue (Forest No. 182), dated 18th December 1884. B.P. No. 86-F., dated 14th February 1885.

History.—Planted on the site of the old Aramby Shola, destroyed by wood-cutters in the early days of settlement on the hills. Planting began in 1863-1865 and the areas planted were the first regular plantation of Eucalyptus on the Nilgiris. In 1870, planting was extended to the neighbouring koolie plantation (Block II of the present Working Plan). Subsequently the grass land between Aramby and Koolie plantations was planted up to form a complete block. The Conifer plantations date from 1889–1890 and the Hard wood areas from 1910–1912.

Records of early treatment are scanty. In the first rotation fellings appear to have been made sometimes as simple coppice, sometimes as coppice with standards.

Writing in 1895, Mr. Tiernan states that the practice was to leave standing the larger trees in a coupe rather than flood the market with unsaleable material. This practice continued through the second and part of third rotation, but after about 20 years or so it was accepted that there is no object in leaving standards over coppice in a forest solely for fuel production; and with the increased demand of an expanding market nearly all standards have been removed. Except for a small patch of high forest (Block IV), practically all bluegum areas are now simple coppice. Block VII which was originally planted with Callitris has now been converted into bluegum.

The bluegum timber has now come into great use recently and almost so to say "the poor man's timber" on the plateau. Hence to provide for a such a cheap timber and to act as a wind belt it is proposed that one phripheral row of bluegum be kept for four rotations (60 years) and then clearfelled for timber.

Compartments.—A detailed description of compartments follows :—

Compartment number and species.	*Area in acres.*	*Year of planting and espacement.*	*Description of crop.*	*Past history.* *Quality class.*	*Past history.* *Year of felling.*	*Past history.* *Method of felling.*	*Past history.* *Age at felling.* YRS.	*Past history.* *Outturn in stacked cubic feet per acre.*	*Remarks.*
			Aramby Block I.						
The block is not divided into compartments.									
Eucalyptus globulus. Acacia .. .. *Melano xylon* .. Callitris .. .. Grass .. .. Shola .. .. Scrub	53·8	Not known	Soil—Grass land type .. .. .. Aspect—West .. .. Slope—Steep to moderate .. .. Crop—This small bit of bluegum is a high forest with undergrowth of Eupatorium.	..	Never worked.	—	..	..	*Eucalyptus globulus* is about 60 years old.
			Aramby Block II.						
1 *Eucalyptus globulus.*	6·50	1875–76, 6 feet × 6 feet. 1945–46 replanted, 9 feet × 9 feet.	Soil—Shola type, deep loam and rocky in place.	III	1889–90	Simple coppice.	14	5,434	
			Aspect—North-west		1899–1900	Do.	10	4,416	
			Slope—Moderate		1909–10	Do.	10	3,483	
			Crop—*Eucalyptus globulus* coppice ..		1927–28	Do.	18	5,581	
					1944–45	Do.	17	4,588	
2 *Do.*	3·50	1875–76, 6 feet × 6 feet ..	Soil—Shola type, deep loam and rocky in places.	III	1891–92	Do.	16	4,624	
			Aspect—West		1901–02	Do.	10	5,527	
			Slope—Moderate		1912–13	Do.	11	4,680	
			Crop—*Eucalyptus* coppice with undergrowth of Eupatorium.		1932–33	Do.	20	6,183	
					1950–51	Do.	18	6,886	
3 *Do.*	3·85	1875–76, 6 feet × 6 feet. 1946–47, 9 feet × 9 feet, replanted.	Soil—Shola type, deep loam and rocky in places.	III	1888–89	Do.	13	8,788	
			Aspect—North-west.		1898–99	Do.	10	6,550	
			Slope—Moderate.		1908–09	Do.	10	4,818	
			Crop—*Eucalyptus globulus* with an undergrowth of Eupatorium.		1926–27	Do.	18	8,254	
					1945–46	Do.	19	9,039	
4 *Do.*	5·10	1875–76, 6 feet × 6 feet ..	Soil—Shola type and deep loam ..	III	1891–92	Do.	16	4,976	
			Aspect—North-east.		1901–02	Do.	10	3,795	
			Slope—Steep.		1912–13	Do.	11	3,620	
			Crop—*Eucalyptus globulus* with Eupatorium undergrowth.		1933–34	Do.	21	3,990	
					1951–52	Do.	18	..	

5	*Do.*	3·17	1875–76, 6 feet × 6 feet. 1940–41, 9 feet × 9 feet.	Soil—Shola type deep loam rocky in places. Aspect—North-west. Slope—Moderate. Crop—*Eucalyptus globulus* with Eupatorium undergrowth.	II	1888–89 1898–99 1908–09 1921–22 1939–40	Do. Do. Do. Do. Do.	13 10 10 13 18	5,408 5,808 4,917 6,308 5,568	
6	*Do.*	2·50	1875–76, 6 feet × 6 feet ..	Soil—Shola type, deep loam and rocky in places. Aspect—North-west. Slope—Moderate. Crop—*Eucalyptus globulus* with Eupatorium undergrowth.	III	1889–90 1899–1900 1909–10 1923–24 1941–42	Do. Do. Do. Do. Do.	14 10 10 13 18	6,240 4,933 4,420 4,898 3,700	
7	*Do.*	2·00	1875–76, 6 feet × 6 feet ..	Soil—Shola type and deep loam .. Aspect—North-west. Slope—Moderate. Crop—*Eucalyptus globulus* with Eupatorium.	III	1887–88 1897–98 1907–08 1922–23 1941–42	Do. Do. Do. Do. Do.	12 10 10 15 19	15,600 7,111 4,554 5,620 3,700	
8	*Do.*	2·12	1875–76, 6 feet × 6 feet ..	Soil—Poor, shola type, stony and rocky. Aspect—North-west. Slope—Moderate to flat. Crop—*Eucalyptus globulus* with Eupatorium.	III	1890–91 1900–01 1911–12 1931–32 1947–48	Do. Do. Do. Do. Do.	15 10 11 20 16	6,336 4,818 4,808 7,709 10,217	
9	*Do.*	2·25	1875–76, 6 feet × 6 feet. 1948–49.	Soil—Shola type and rocky in places .. Aspect—North. Slope—Gentle to steep. Crop—*Eucalyptus globulus* with Eupatorium.	III	1889–90 1899–1900 1909–10 1930–31 1947–48	Do. Do. Do. Do. Do.	14 10 10 21 17	12,032 6,319 5,032 8,079 7,964	
10	*Do.*	4·25	1875–76, 6 feet × 6 feet ..	Soil—Shola type .. .. .. Aspect—North-west. Slope—Steep. Crop—*Eucalyptus globulus* with Eupatorium.	III	1886–87 1896–97 1906–07 1924–25 1943–44	Do. Do. Do. Do. Do.	11 10 10 18 19	10,736 5,890 3,894 5,139 4,362	
11	*Do.*	3·50	1875–76, 6 feet × 6 feet. 1948–49, 9 feet × 9 feet.	Soil—Shola type and deep red loam .. Aspect—North-west. Slope—Very steep. Crop—*Eucalyptus* with Eupatorium.	III	1890–91 1900–01 1911–12 1931–32 1947–48	Do. Do. Do. Do. Do.	15 10 11 20 16	6,501 4,603 4,665 7,170 4,011	
12	*Do.*	2·33	1875–76, 6 feet × 6 feet. 1945–46, 9 feet × 9 feet.	Soil—Shola type and red loam .. .. Aspect—North-west. Slope—Steep. Crop—*Eucalyptus globulus* with Eupatorium.	III	1887–88 1897–98 1907–08 1925–26 1944–45	Do. Do. Do. Do. Do.	12 10 10 18 19	6,048 5,472 4,306 6,312 6,506	
13	*Do.*	2·27	1875–76, 6 feet × 6 feet ..	Soil—Shola type and red loam .. .. Aspect—North-west. Slope—Moderate steep. Crop—*Eucalyptus globulus* with Eupatorium.	III	1891–92 1900–01 1911–12 1931–32 1949–50	Do. Do. Do. Do. Do.	16 9 11 20 18	2,772 4,240 3,809 5,775 6,171	Obviously wrong.
14	*Do.*	2·40	1875–76, 6 feet × 6 feet ..	Soil—Shola type, red loam and stony in some places. Aspect—North-west. Slope—Steep. Crop—*Eucalyptus globulus* with Eupatorium.	III	1891–92 1901–02 1912–13 1933–34 1951–52	Do. Do. Do. Do. Do.	16 10 11 21 18	2,887 4,125 4,416 6,480 4,920	
15	*Do.*	2·50	1875–76, 6 feet × 6 feet .. 1947–48, 9 feet × 9 feet.	Soil—Shola type and deep red loam .. Aspect—North to north-east. Slope—Moderate. Crop—*Eucalyptus globulus* with Eupatorium undergrowth.	III	1888–89 1898–99 1908–09 1928–29 1946–47	Do. Do. Do. Do. Do.	12 10 10 20 18	9,152 11,715 7,474 7,440 5,112	

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Past history. Method of felling.	Past history. Age at felling. YRS.	Past history. Outturn in stacked cubic feet per acre.	Remarks.
			Aramby Block II—cont.						
16 *Eucalyptus globulus.*	4·14	1883–86, 6 feet × 6 feet .. 1947–48, 9 feet × 9 feet.	Soil—Grass land type, shallow, red loam and stoney in steep places. Aspect—North-west. Slope—Gentle to steep. Crop—*Eucalyptus globulus* with Eupatorium.	III	1911–12 1928–29 1946–47	Simple coppice. Do. Do.	.. 17 18	— 5,480 3,986	
17 *Do.*	5·37	1883–86	Soil—Grass land type and red loam with stones in steep places. Aspect—South-west. Slope—Gentle to steep. Crop—*Eucalyptus globulus* with Eupatorium.	III	1911–12 1935–36 1951–52	Do. Do. Do.	.. 24 16	.. 5,160 ..	
18 *Do.*	8·50	1883–86, 6 feet × 6 feet ..	Soil—Grass land type, poor and shallow red loam. Aspect—North-east. Slope—Gentle. Crop—*Eucalyptus globulus* with Eupatorium.	III	1911–12 1934–35 1949–50	Do. Do. Do.	.. 23 15	.. 5,400 3,459	
			Aramby Block III.						
1 *Eucalyptus globulus.*	5·50	1885, 6 feet × 6 feet .. 1947–48, 9 feet × 9 feet.	Soil—Grass land type and red loam .. Aspect—North-west. Slope—Moderate. Crop—*Eucalyptus globulus* callitris.	III	1897–98 1907–08 1927–28 1944–45	Simple coppice. Do. Do. Do.	12 10 20 17	4,422 4,757 6,512 5,542	
2 *Do.*	9·50	1885, 6 feet × 6 feet .. 1943–44, 9 feet × 9 feet.	Soil—Grass land type and red loam .. Aspect—North-west. Slope—Gentle.	III	1896–97 1906–07 1923–24 1942–43	Do. Do. Do. Do.	11 10 17 19	4,735 4,719 6,239 4,274	
3 *Do.*	4·60	1885, 6 feet × 6 feet ..	Soil—Grass land type and red loam .. Aspect—North-west. Slope—Gentle. Crop—*Eucalyptus globulus* with Eupatorium.	III	1898–99 1908–09 1932–33 1950–51	Do. Do. Do. Do.	13 10 24 18	3,564 3,267 6,000 3,934	
4 *Do.*	5·00	1886, 6 feet × 6 feet ..	Soil—Grass land and ferruzineous loam. Aspect—East .. .. Slope—Gantle. Crop—*Eucalyptus* with Eupatorium.	III	1900–01 1911–12 1935–36 1951–52	Do. Do. Do. Do.	14 10 24 16	6,072 3,252 5,812 ..	
5 *Do.*	2·80	1883, 6 feet × 6 feet ..	Soil—Shola and grass land type, red loam at places. Aspect—East. Slope—Gentle. Crop—*Eucalyptus globulus* with Eupatorium.	III	1895–96 1905–06 1925–26 1945–46	Do. Do. Do. Do.	12 10 20 20	3,056 3,531 6,906 7,307	
6 *Do.*	5·40	1886, 6 feet × 6 feet .. 1947–48, 9 feet × 9 feet.	Soil—Grass land type and red loam .. Aspect—South to south-west. Slope—Gentle. Crop—*Eucalyptus globulus* with Eupatorium.	III	1899–1900 1908–09 1930–31 1947–48	Do. Do. Do. Do.	13 9 22 17	3,888 3,500 6,764 4,777	
7 *Do.*	5·60	1885, 6 feet × 6 feet ..	Soil—Grass land type and red loam .. Aspect—North-west. Slope—Gentle. Crop—*Eucalyptus globulus* with Eupatorium.	III	1893–94 1903–04 1918–19 1953–54	Do. Do. Do. Do.	8 10 15 ..	2,688 3,828 5,053 ..	

8 Do.	10·80	Do.	Soil—Shola and grass land red loam type. Aspect—North-west Slope—Moderate. Crop—*Eucalyptus globulus* with Eupatorium.	III	1894–95 1904–05 1919–20 1941–42	Coppice with standards simple coppice.	9 10 14 22	2,628 5,940 10,049 8,453	
9 Do.	11·50	1887, 6 feet × 6 feet	Soil—Poor grass land red loam Aspect—West. Slope—Moderate to flat. Crop—*Eucalyptus globulus* with Eupatorium.	III	1897–98 1907–08 1921–22 1942–43	Do.	10 10 14 21	3,465 2,491 4,433 3,960	
10 Do.	4·55	1887, 6 feet × 6 feet	Soil—Poor grass land type and red loam. Aspect—West Slope—Gentle Crop—*Eucalyptus globulus* with Eupatorium.	III	1901–02 1912–13 1933–34 1948–49	Single coppice.	14 11 21 15	4,933 4,440 4,849 4,868	
11 Do.	5·25	1887, 6 feet × 6 feet	Soil—Grass land type, red loam Aspect—South-west Slope—Gentle Crop—*Eucalyptus globulus* with Eupatorium.	III	1896–97 1906–07 1926–27 1944–45	Do.	9 10 20 18	3,811 1,419 7,259 4,173	
12 Do.	2·60	1887, 6 feet × 6 feet	Soil—Grass land type Aspect—South-west Slope—Gentle Crop—*Eucalyptus globulus* with Eupatorium.	III	1894–95 1904–05 1923–24	Do.	7 10 19	2,838 3,811 7,859	
13 Do.	10·20	1887, 6 feet × 6 feet 1948–49, 9 feet × 9 feet	Soil—Grass land type Aspect—South-east to South-west Slope—Moderate to steep Crop—*Eucalyptus* with Eupatorium.	III	1898–99 1908–09 1929–30 1947–48	Do.	11 10 21 18	3,679 3,696 5,527 5,865	
			Aramby Block IV.						
Eucalyptus globulus (High Forest).	..	1863, 6 feet × 6 feet	Soil—Grass land type Aspect—South-west Slope—Gentle Crop—*Eucalyptus* with Eupatorium.	..	1877–1902 .. 1925–26	Thinned	 62	 5,526	
			Aramby Block V.						
1 *Eucalyptus globulus*.	3·25	1868, 6 feet × 6 feet	Aspect—South-west Slope—Steep Soil—Shola type, red loam Crop—*Eucalyptus globulus* and some *Eucalyptus sieberiana* coppice of moderate growth with Eupatorium undergrowth.	III	1883–84 1893–94 1908–04 1916–17 1938–39	Simple coppice. Do. Do. Do.	20 10 10 13 22	Not known. 5,808 3,960 5,033 7,306	Thinned thrice including the last in 1877. This compartment has been burnt several times before 1912.
2 Do.	3·93	1863, 6 feet × 6 feet	Aspect—South west Slope—Gentle to steep Soil—Shola type red loam stony in place Crop—*Eucalyptus globulus* with some *Eucalyptus obliqua* and *Eucalyptus gunnii* coppice of moderate growth, but poor in small patches with Eupatorium under growth all over.	III	1885–86 1895–96 1905–06 1917–18 1952–53	.. Coppice with Standards. Simple coppice.	22 10 10 12 ..	Not known. 5,082 6,204 2,230	Thinned thrice including the last in 1887. Subject to fire.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Aramby Block V—cont.						
3 *Eucalyptus globulus*	6·3	1863, 6 feet × 6 feet	Aspect—South-west Slope—Steep Soil—Shola type, red loam without crops of rocks here and there. Crop—*Eucalyptus globulus* coppice of moderate growth with Eupatorium under growth.	III	1882–83 1892–93 1902–03 1917–18 1939–40	Coppice with Standards.	19 10 10 15 22	Not known 3,267 3,316 4,490 5,246	Thinned in 1877. There are some small blanks here and there. There are a few standards. Fires have burnt the eastern portion several times before 1912. The 1917–18 felling included some standards.
Do.	5·5	1863, 6 feet × 6 feet	Aspect—West Slope—Steep Soil—Shola type, red loam in the rocks north-east corner. Crop—*Eucalyptus globulus* coppice of moderate growth but poor in the north-west.	III	1886–87 1896–97 1906–07 1919–20 1938–39 1953–54	Simple coppice	23 10 10 13 19 ..	5,056 6,336 3,564 4,689 7,036	Thinned in 1877. A narrow strip in the east has been burnt on several occasions and the last one was in 1911. Early yield figures not reliable.
5 Do.	5·65	1863, 6 feet × 6 feet 1941–42, 9 feet × 9 feet	Aspect—West Slope—Moderate Soil—Shola type, red loam. Crop—*Eucalyptus globulus* coppice of moderate growth.	III	1887–88 1897–98 1907–08 1919–20 1940–41	Do.	24 10 10 12 21	14,768 5,791 4,026 6,259 6,330	Thinned in 1887. Burnt over in 1911–12.
6 *Eucalyptus globulus Shola.*	7·15	1863, 6 feet × 6 feet	Aspect—West Crop—*Ecualyptus globulus* coppice of good growth with Eupatorium undergrowth.	III	1884–85 1894–95 1904–05 1920–21 1940–41	Coppice with Standards Simple Coppice.	21 10 10 16 20	Not known. 1,817 7,491 8.690 7,211	Burnt over in 1911. Thinned in 1877.
7 Do.	5·5	1863, 6 feet × 6 feet	Aspect—West Slope—Gentle Soil—Shola type, deep red loam. Crop—*Eucalyptus globulus* coppice of of good growth with Eupatorium.	III I	1892–93 1902–03 1913–14 1936–37 1951–52	Probably a thinning. Simple Coppice.	29 10 10 22 15	6,517 4,339 5,921 10,786 ..	
8 *Eucalyptus globnlus*	6·25	1863, 6 feet × 6 feet	Aspect—West Slope—Gentle to flat Soil—Shola type, deep red loam Crop—*Eucalyptus globulus* coppice of fairly good growth with Eupatorium under growth. Density—0·6 Canopy—Nearly open since some trees have been felled for posts in 1935–36.	III	1892–94 1903–04 1914–15 1936–37 1952–53	Coppice with Standards. Coppice with few standard. Simple Coppice.	30 10 11 22 16	5,134 5,494 3,010 6,714 ..	
9 Do.	3·12	1863, 6 feet × 6 feet	Aspect—South-west Slope—Gentle Soil—Shola type and red loam of good depth. Crop—*Eucalyptus globulus* coppice of vigorous growth with Eupatorium undergrowth.	III	1883–84 1893–94 1903–04 1915–16 1934–35 1948–49	Simple coppice	20 10 10 12 19 14	Not known. 5,791 5,098 5,828 7,560 5,714	

10	Do.	1·0	1882, 6 feet × 6 feet ..	Aspect—East to north-east .. .. Slope—Nearly flat .. .. .. Soil—Poor grass land type, red loam .. Crop—*Eucalyptus globulus* coppice of moderate growth with Eupatorium.	III	1897–98 1906–07 1925–26 1943–44	Simple coppice	15 9 19 18	3,069 2,470 5,562 9,660	
11	....	..	....	Disreserved—Except for a small area 0·20 acre, the whole of the compartment was disreserved in 1927. This small plot has been added to compartment 12.	..	..	....	..	..	
12	*Eucalyptus globulus.*	7·2	1863–65, 6 feet × 6 feet ..	Aspect—North .. .. Slope—Moderate .. .. Soil—Semi shola and grassal type .. Crop—*Eucalyptus globulus* coppice with some shola shrubs as under growth.	III	1884–85 1894–95 1904–05 1915–16 1953–54	Coppice with standards. Simple coppice	21 10 10 11 18	Not known. 3,605 4,061 4,109 ..	
13	*Eucalyptus globulus* Shola.	3·20	1863–65, 6 feet × 6 feet ..	Aspect—North .. .. Soil—Grass land and poor shola type. .. Crop—*Eucalyptus globulus* coppice of of poor type.	III	1885–86 1895–96 1905–06 1924–25 1943–44	Simple coppice	21 10 10 19 19	Not known 3,069 1,699 4,544 5,551	
14	Do.	4·9	1881–85, 6 feet × 6 feet ..	Aspect—North .. .. Slope—Gentle .. .. Crop-poor *Eucalyptus globulus*	III	1890–1900 1909–10 1926–27 1946–47	Do.	17 10 17 20	3,960 3,300 4,169 4,620	
15	Do.	3·6	1881–85, 6 feet × 6 feet ..	Aspect—North .. .. Slope—Gentle .. .. Crop—*Eucalyptus globulus* underwood.	III	1895–96 1905–06 1916–17	Coppice with Standards. Simple coppice	13 10 11	1,782 2,271 3,073	This compartment was irregularly worked for poles up to 1912.
16	Cryptomeria japonica Shola Swamp.	0·5 15·3 3·5	1885–86	Aspect—West .. .. Slope—Moderate .. .. Soil—Shola type .. .. Crop—Cryptomeria japonica high forest with some *Eucalyptus globulus* trees with spares Eupatorium forming the undergrowth.	This compartment has never been worked or felled.					
17A	*Eucalyptus globulus*	4·80	1828–29, 6 feet × 6 feet ..	Aspect—South-west .. .. Slope—Steep .. .. Soil—Partly shola and partly grass land type red loam.	III	1907–08 1923–24 ..	Thinning of Removal of.	21 38	1,604 4,337	17-A and B planted 1885–88 as a mixture of Callitris, cryptomeria and some pines.
				Crop—*Eucalyptus globulus* of moderate growth with undergrowth of Eupatorium.		1946–47		18	5,950	Cryptomeria was in most place much suppressed by the callitris. The felling in 1907–08 was thinning that in 1923–24 was removal of all callitris except seedling under growth to free *Cryptomeria fapo-nica*. In the north east corner there is a small patch of *Pinus longifolia* and *Pinuc insignis*. Sub compartment (*a*) converted to Blue gum in 1928–29. The yield given is for both (A) and (B).

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Aramby Block V—cont.						
17B Cryptomeria japonica	6·7	1885–88	Aspect—South west .. .. Slope—Steep .. .. Soil—Shola type and red loam .. .. Crop—A mixture of *Cryptomeria japonica Callitris rhomboides* and some pinec. Crop of moderate growth but in the north where there is no undergrowth except callitris.	.. ..	1907–08 1923–24	Thinning Removal of callitris.	21 38	1,604 4,337	1923–24 felling was removal of callitries except seedling undergrowth to free *Cryptomeria japonica*. The yield figure given is both for 17A and 17-B.
			Aramby Block VI.						
1 *Eucalyptus* eugenioides Grass.	4·3 0·8 5·1	1912, 6 feet × 6 feet ..	Aspect—South-east .. .. Slope—Moderate .. .. Soil—Grass-land type, red loam .. Crop—*Eucalyptus eugenioides* seedling crop of moderate growth with Eupatorium undergrowth.	..	1930–31	Thinning ..	18	540	In the east there is fairly a big blank. There is a sample plot to measure girths periodically. The compartment line is marked by a callitris hedge.
2 *Eucalyptus Pilularis* Grass.	4·4 0·7 5·1	1912—6 feet × 6 feet ..	Aspect—South .. .. Slope—Moderate. Soil—Grass land type red loam. Crop—*Eucalyptus pilularis* seedling crop of moderte to good growth with Eupatorium under growth.	..	1925–26	Thinning ..	13	2,543	There is a sample plot to record girth measurements periodically.
3 *Eucalyptus globulus.*	5·2	1911—6 feet × 6 feet .. 1944–45—9 feet × 9 feet..	Aspect—South-west .. .. Slope—Moderate. Soil—Grass land type, red loam. Crop—*Eucalyptus hemipholia of* seedling poor crooked crop with Eupatorium undergrowth.	II	..	..	..	..	Originally planted with *Eucalyptus hemiphloea* and as it was not thinned, it was replanted with *Eucalyptus globulus* in 1944–45.
4 *Eucalyptus propinques.*	4·6	1911—6 feet × 6 feet ..	Aspect—South .. .. Slope—Moderate. Soil—Grass land type, red loam. Crop—*Eucalyptus propinqua* seedling crop of fairly good growth with some Eupatorium undergrowth in a small portion in the north.	..	1925–26	Thinning ..	14	1,467	There is a sample plot to record girths periodically. Below the bridle-path, it is mixed with other Eucalyptus species.
5 *Eucalyptus acmenoides Grass.*	4·1 0·3 4·4	1911—6 feet × 6 feet ..	Aspect—North west .. .. Slope—Moderate. Soil—Grass land type, red loam. Crop—*Eucalyptus acmenoides* seedlings crop of moderate growth with Eupatorium undergrowth.	..	1932–33	Thinning ..	21	1,140	There is a sample plot to record girths periodically.
6 *Eucalyptus paniculata.*	3·6	1911—6 feet × 6 feet ..	Aspect—North .. .. Slope—Grass land type, red loam .. Crop—*Eucalyputus paniculata* seedling of moderate growth, but in the extreme north is rather poor. There are a few other Eucalyptus species with Eupatorium undergrowth.	..	..	..	..	..	There is a sample plot to record girths periodically.

7 Eucalyptus globulus.	4·7	1911—6 feet × 6 feet 1942–43—9 feet × 9 feet.	Aspect—North Slope—Gentle Soil—Grass-land type, red loam Crop—*Eucalyptus globulus* seedling crop, very poor, with Eupatorium under-growth.	II	1941–42	..	..	..	Originally *Eucalyptus crebra*. As this species did not come up well in 1942–43 it was replanted with *Eucalyptus globulus*.
8 Do.	4·9	1911—6 feet × 6 feet 1942–43—9 feet × 9 feet.	Aspect—North Slope—Gentle Soil—Grass-land type, red loam. Crop—*Eucalyptus crebra* seedling crop of very poor quality with Eupatorium undergrowth.	II	..	..	..	..	Originally planted with *Eucalyptus crebra*, and as it did not thrive well, it was replanted with *Eucalyptus globulus* in 1942–43.
9 Eucalyptus punctata. Shola.	3·1 0·1 ·2	1911—6 feet × 6 feet	Aspect—East Slope—Moderate Soil—Grassland type. Crop—*Eucalyptus punctata* seedling crop of fair growth, Eupatorium under-growth.		1918 1933–34	Thinning Do.	7 22	492 2,760	There are a few other *Eucalyptus species*. The coppice shoots are vigorous. Badly damaged by the storm of 1936. There is a sample plot.
			Aramby Block VII.						
1 Eucalyptus globulus.	6·0	1889–90—6 feet × 6 feet. 1944–45—9 feet × 9 feet.	Aspect—South-west Slope—Gentle Soil—Both grass and shola type.	III ..	1906–07 1942–43	Thinning ..	17 36	Not known. 2,909	Originally callitris with bluegum in 1944–45. The yield is for both VII-1 and VII-2.
2 Do.	11·0	1889–90—6 feet × 6 feet. 1944–45—9 feet × 9 feet.	Aspect—South-west Slope—Moderate Soil— Grass-land type, red loam Bluegum.	III ..	1906–07 1942–43	Thinning	17 36	Not known 2,909	Do.
3A Do.	3·25	1929–30—6 feet × 6 feet. 1947–48—9 feet × 9 feet.	Aspect—South Slope—Moderate Soil—Both shola and grass-land type Crop—Eucalytpus of different growth with undergrowth of Eupatorium and some callitris.	III	1906–07 1925–26 1928–29 The above figures are for callitris. 1946–47	Thinning Do. Clear felling ..	17 36 39 18	Do. .. 1,818 6,448	There are few blanks here and there. Originally this compartment consisted of callitris planted in 1889–90 yield figues for 1906 and 1925 relate to the whole of compartment converted by bluegum in 1947–48.
3B Do.	3·50	1930–31—6 feet — 6 feet. 1947–48—9 feet — 9 feet.	Aspect—South Slope-Moderate Soil—Both shola and grass-land type-red loam. Crop—*Eucalyptus globulus* with Eupatorium.	III ..	190^6–07 1925–26 1946–47	Thinning Do.	17 36 17	Not known. 8,360 7,286	The figures given are for callitris planted in 1889–90. Yield figures for 1906 and 1925 relate to the whole of compart. ment-3.
3C Eucalyptus globulus.	3·9	1931–32—6 feet × 6 feet.	Aspect—South Slope—Mostly grass-land type red-loam. Crop—*Eucalyptus globulus* seedling crop of good growth with Eupatorium undergrowth with callitris.	III I	1906–07 1925–26 1930–31 1949–50	Thinning Do. Clear felling	17 36 41 18	Not known. 8,360 2,800 8,614	Originally planted with callitris in 1889–90 and the figures given are for callitris. Yield figures for 1906 and 1925 relate to the whole of compartment 3.

Compartment number and species.	Area in acres	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Past history. Method of felling.	Past history. Age at felling.	Past history. Outturn in stacked cubic feet per acre.	Remarks.
			Aramby Block VII—cont.						
4A *Eucalyptus globulus shola.*	2·75	1932–33—6 feet × 6 feet.	Aspect—South .. .. Slope—Moderate .. .. Soil—Both shola and grass-land type, red loam. Crop—Vigorously growing Eucalyptus globulus seedling crop with Eupatorium undergrowth. Density—0·9. Canopy—Nearly close. Average height—31 feet. Average girth—17 feet. Age when measured—3.	III	1906–07 1931–32 1948–49	Thinning .. Clear felling ..	17 42 16	Not known. 3,762 8,532	The figures given here are for callitris planted in 1889–90.
4B *Eucalyptus globulus grass.*	3·9	1933–34—6 feet × 6 feet.	Aspect—South .. .. Slope—Moderate. Soil—Both shola and grass type, red loam. Crop—Vigorously grown *Eucalyptus globulus* seedling crop with Eupatorium undergrowth.	II	1906–07 1932–33 1950–51	Thinning .. Clear felling ..	17 43 17	Not known. 3,500 6,400	The figures given here are for callitris planted in 1889–90.
2 Addition II ..	12·50	1944–45—9 feet × 9 feet.	Aspect—North-eastern. .. .. .. Slope—Moderate to flat. Soil—Grass land type. Crop—Eord sized *Eucalyptus globulus.*	..	1943–44	..	..	7,729	A portion of (2·3 acre) remains as the Minor Forests coupe compartment site. This portion shall be left as such.

WORKING PLAN FOR THE NILGIRIS DIVISION.

DODABETTA SERIES.

Area.—The total area is 275·52 acres.

Forest settlement—Dodabetta.—The area is included in the Dodabetta Reserved Forest Dharmatope was notified in G.O. No. 322, Revenue (Forest No. 51), dated 14th March 1885, Newman, Dharmatope, Mynalai, Honnathalai and Jackhall embodied in B.P. No. 1020, dated 27th March 1885. A pubic right of way over the Bilkoal bridle path admitted. The Todas have a right to graze their cattle and collect dead wood for fuel.

Newman.—It was notified in G.O. No. 188, Revenue (Forest No. 23), dated 13th March 1886, embodied in B.P. No. 315, dated 18th July 1891.

History—Dodabetta.—The hardwood area was planted between 1892 and 1924. The origin of the *Eucalyptus globulus* portion is unknown. It had never before been included in any working scheme before Dyson's Working Plan. In 1928 it appeared to be about 30 years old. Between 1929 and 1931 compartments 5 and 6 which contain bluegum were clearfelled. The hardwoods are being proposed to be felled and converted into bluegum.

Dharmatope seems to have been formed in 1876 by the Jungle Conservancy department as an object leases to the Badagas of the advantages of planting *Eucalyptus* in the grassy slope of the Nilgiris around Dhavani, etc.

Newman.—Newman was formed in 1870–71 by the Jungle Conservancy department. An attempt to work Newman for charcoal was made in 1896. Apart from that, the plantations remained unworked till 1915. Between that date and 1925, the whole plantation was worked over by the thinning it, the outturn being converted into charcoal In 1925–26 treatment as high forest was abandoned and in that on the following year the remaining trees in compartments 2 and 3 were felled leaving these compartments as simple coppice. The rest of the plantations, which stood as high forest in which thinnings of greater or lesser intensity had been carried out between 1915 and 1925 had been worked under simple coppice system from 1944–45. Up to 1950–51 and the fellings are complete and only a seedling coppice crop is now standing to be worked for third rotation.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Dodabetta.						
1 *Eucalyptus eugenioides.*	11·5	1922—6 feet × 6 feet.	Aspect—Mostly west .. .. .. Slope—Steep towards west and elsewhere moderate. Soil—Grassland type. Crop—*Eucalyptus eugenioides* seedling crop, not very promising, with undergrowth of eupatorium throughout except in the west where it is shola shrubs.	II	1933–44	Thinning ..	11	1,617	Compartments lines marked by hedge of callitris. The coppice shoots from thinned stumps are poor. There was accidental fire in 1936.
2 *Eucalyptus globulus.*	15·5	1923—6 feet × 6 feet ..	Aspect—West and West to North .. Slope—Slightly steep towards and moderate to the North. Soil—Grass land type .. .. .. Crop—*Eucalyptus globulus* seedling crop of poor quality.	II	1934–35 1953–54	Do.	11 19	774	Converted into bluegum.
3 *Eucalyptus punctata* with some *Eucalyptus eugenioides in the west rock.*	31·0	1924—6 feet × 6 feet ..	Aspect—East, North and North-west .. Slope—Mostly steep. Soil—Grass land type. Crop—About one-seventh of the area is covered by *eucalyptus eugenioides* with eupatorium and shola shrubs as undergrowth and the rest of the area is occupied by *Eucalyptus punctata* with the same undergrowth, but in the middle it is more or less pure eupatorium. A few *eucalyptus eugenioides* is mixed with punctata. The plantation is not good.	..	1935–36	Thinning ..	11	666	Subdivided with 3 (a) and 3 (b) 15·5 acres each.
4 *Eucalyptus punctata.*	42·7	1924—6 feet × 6 feet ..	Aspect—Mostly south-west .. .. Slope—Steep. Soil—Poor grass land type. Crop—*Eucalyptus punctata* seedling crop with admixture of *eucalyptus eugenioides* in the north and a few scattered here and there. The crop is very poor on the hill top; elsewhere it is moderate. The undergrowth consists of shola shrubs all round the plantation; it is mixed with eupatorium in the east and pure eupatorium occurs in the centre.	II	1935–36 and 1936–37	Do. ..	11/12	1,065	Calltris occurs in the east and south to some extent. A few trees are damaged by wind. Subdivided into 4 (a), 4 (b), and 4 (c), to be converted into bluegum after felling.
5 *Eucalyptus globulus.*	6·50	Not known	Aspect—West .. .. Slope—Moderate to steep Soil—Poor grassland type. Crop—Rather indifferent crop of *eucalyptus globulus* coppice with both eupatorium and shola shrubs as undergrowth.	II	1929–30 1943–44	Simple coppice. Do.	.. ..	7,906 3,195	History unknown and brought under working for the past time in Mr. Dyson's plan.
6 Do.	6·67	Do. — ..	Aspect—West .. .. Slope—Steep. Soil—Poor grass land type. Crop—The growth of *eucalyptus globulus* coppice of this compartment is slightly better than that of 5 above. Under growth of both shola shrubs and eupatorium all over.	III ..	1930–31 1945–46	Do. Do.	.. ..	9,451 5,856	See remarks above.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Dharma Tope.						
Not divided—*Eucalyptus globulus.*	12·50	1876	Aspect—North-west .. Slope—Moderate. Soil—Mackist loam of low depth. Crop—*Eucalyptus globulus.*	III	1944–45	Thinning ..	68	25,610	
			New Man.						
1 *Eucalptus globulus* coppice.	2·80	1870–71—6 feet × 6 feet.	Aspect—North .. Slope—Gentle. Soil—Shola type, black clayey loam. Crop—Bluegum coppice with eupatorium.	III	1916–17 1947–48	Thinning coppice.	46 77	22,656 9,980	Plantation was badly burnt in 1878 when 482 cartloads of dead wood were extracted. In 1896–97 an attempt was made to manufacture charcoal by a patent " Moorean " vion kiln. The attempt was abandoned after 70 lb. had been converted. The crop had the appearance of coppice with standards. Now it is simple coppice crop.
2 Do.	3·10	1870–71—6 feet × 6 feet.	Aspect—North-east .. .. .. Slope—Gentle .. .. Soil—Grass land type, clayey loam, fairly deep and moist. Crop—*Eucalyptus globulus coppice*, with Eupatorium.	II	1918–19 1925–26 1926–27 1948–49	Thinning .. Do. .. Removal of trees left after thinning owing to decision to treat as simple coppice.	48 55 22	8,829 14,014 7,720	See remarks above.
3 *Do.*	2·90	1870–71—6 feet by 6 feet.	Aspect—North-east .. Slope—Gentle .. .. .. Soil—Grassland type, clayey loam, fairly moist and deep. Crop—*Eucalyptus globulus* coppice ..	II	1919–20 1925–27 1949–50 1950–51	Thinning .. Clear felling .. Do. ..	49 55/56 24/25	16,671 14,358 7,800	
4 *Eucalyptus globulus.*	2·5	1870–71—6 feet by 6 feet.	Aspect—North-east .. .. .. Slope—Pretty steep. Soil—Shola type, black clayey loam, deep. Crop—*Eucalyptus globulus* with undergrowth of Eupatorium mixed with shola shrubs.	II	1920–21 1944–45	Thinning .. Simple coppice.	50 74	12,938 12,400	See remarks above.

5	Do.	4·50	1870–71—6 feet by 6 feet.	Aspect—North .. .. Slope—Pretty steep.	III	1921–22	Thinning ..	51	6,601	Do.
				Soil—Shola type, black clayey loam, fairly moist and deep.		1947–48	Simple coppice.	77	18,996	Do.
				Crop—*Eucalyptus globulus.*						
6	Do.	3·13	1870–71—6 feet by 6 feet.	Aspect—North-east	II	1922–23	Thinning ..	52	9,317	
				Slope—Moderate.		1946–47	Coppice ..	76	10,940	
				Soil—Shola type, clayey loam, deep and moist.						
				Crop—*Eucalyptus globulus.*						
7	Do.	2·50	1870–71—6 feet by 6 feet.	Aspect—North-east	II	1920–23	Thinning ..	50–53	15,074	See remarks above.
				Slope—Steep		1946–47	Coppice ..	76	13,975	
				Soil—Shola type, clayey loam, moist and deep.						
				Crop—*Eucalyptus globulus.* Undergrowth of Shola shrubs mixed with Eupatorium.						
8	Do.	1·0	1870–71—6 feet by 6 feet.	Aspect—North-east	II	1923–24	Thinning ..	53	19,500	Do.
				Slope—Steep		1946–47	Coppice ..	76	17,140	
				Soil—Shola type, clayey loam, deep and moist.						
				Crop—*Eucalyptus globulus* with shola shrubs as undergrowth.						
9	Do.	3·87	1870–71—6 feet by 6 feet.	Aspect—North-east	II	1924–25	Thinning ..	54	15,295	Do.
				Slope—Steep		1946–47	Coppice ..	76	10,050	
				Soil—Shola type, clayey loam, deep and moist.						
				Crop—*Eucalyptus globulus* with sparse growth of Shola shrubs and Eupatorim.						

WORKING PLAN FOR NILGIRIS DIVISION.

THE JACKAL PLANTATION—(HUNT COVERTS).

The object of the plantations were to provide sheltered places in which to put belt in the days when hunting was almost, entirely confined to the Home Downs and there was a corresponding scarcity of "Home" jackals. The plantations including fencing cost Rs. 540. Sometime between 1909 and 1913 a further sum of Rs. 754–5–0 was spent on the plantations in addition to some small contributions from Hunt funds.

These are being maintained and will be continued to be maintained for Hunt and Aesthetic purposes.

Name of Plantation.	*Species.*	*Area in acres.*	*Year of planting and espacement.*	*Description of crop.*	*Past history.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1 New	Mixture of Hakea and Cypress.	1·0	1900–01	Aspect—North, Slope—Steep, Soil—Grass land type, reddish loam, Crop—Growth and good stocked.		
2 Mills ..	Mixture of Hakea and Cypress.	1·0	1900–01	Aspect—North, Slope—Steep, Soil—Grass land type, reddish loom, Crop—Full stocked, growth good.		
3 Point to point.	Cypress and Khassia.	1·0	1900–01	Aspect—East, Slope—Moderate, Soil—Grass land type, reddish loam, Crop—A number of blanks due to failure of the Oak of which there is little left.		
4 Rocks ..	Cypress	1·0	1900–01	Aspect—North-east, Slope—Moderate Crop—Lower part a failure due to frost. Elsewhere growth poor.	In 1916 gorse, broom and Acacia decurrens sown in blanks with little success.	
5 Hakea, ..	Cypress Hakea, Alnus, Fifes *Rhododendron Legistrum Harrisonia Bennetti Zizyphus incurva.*	1·06	1902–05	Aspect—North, Slope—Moderate, Soil—Grass land, reddish loam, Crop—Growth of Cypress poor and that of the rest which have been planted recently is fair.	The area was originally planted with Cypress, but it was more or less of a failure. 1916—Grose, broom and Acacia decurrens sown in blanks but with little success. 1932–33—The failed portion planted with Rhododendron and Hakea. Plant is shaded. Fenced with plain wire at a cost of Rs. 87–4–0. 1933–34—Casualties replaced with Hakea. Plant is shaded. Most of these failed owing to frost. 1934–35—Casualties replaced with Hakea, most of these failed owing to frost. 1935–36—Casualties replaced with Alnus, Hakea and Legustrum. Soil worked with wood ash. Frost shades were erected. 1936–37—*Zizyphus incurva, Harrisonia bennetti, Legustrum* were used for replacing casualties. Soil worked. Plant is less than ½ foot high were frost shaded. The cost of plantation from 1932–33 excluding the cost of fence is Rs. 33–4–6.	The idea of this mixed crop is to fill up the blank with trees of Shola species or which resembles Shola species.

Governor's Shola Series.

Area.—The total area of the series is 273·82 acres.

The total planted area is 273·82.

Forest settlement.—Culli, Chowghat Culli, Governor's Shola, Sheffield, Andy, Huppatti and Chemunguli were included within reserve forests by G.O. No. 1407, Revenue (Forest No. 182), dated 18th December 1884, embodied in B.P. No. 86 (Forest No. 16), dated 14th January 1885. Anaikal Plantation was included in Krurmund North Reserve Forest notified in G.O. No. 188, Revenue (Forest No. 23), dated 13th March 1886, embodied in B.P. Forest No. 759, dated 30th March 1886. All are now absorbed in the Wenlock Downs Reserve Forest notified in March 1900.

There are no rights admitted which affects the plantations.

History.—With the exception of Chemunguli which lies several miles to the north-west, all the rest of the plantations are grouped together and are loosely known as Governor's Shola, though the designation is strictly applicable only to the area called block VI. Governor's Shola itself was thrown open to felling in 1860, when Mr. Wilson undertook the annual contract for the supply of fuel to Ootacamund for a sum of Rs. 3,900.

In passing it may be mentioned that the market rate of sale was fixed at Rs. 3–8–0 per 750 lb. or Rs. 10–8–0 per ton which comes to roughly Rs. 20 to 25.

The felling was promptly followed by planting, but most of the work was very unsuccessful. Colonel Beddome stated that by end of 1865, 150 acres of Shola had been destroyed and only 10 acres of Acacia plantation formed.

From 1865 to 1868 a considerable area of the destroyed Shola must have been planted up with Acacia, much of which evidently failed. From 1870 only *Eucalyptus globulus* was planted and the mixture of species in all blocks seems to indicate the partial failure of Acacia planting and the subsequent introduction of Eucalyptus. Exceptions to this are Sheffield (originally pure Acacia) and Anaikal pure blue gum.

All that is known of the origin of Chemunguli (" Bacon Wood ") is that in 1879, 36 acres of Shola were cut down and 39,200 blue gum seedlings were planted.

Work in all these blocks was carried out in an irregular manner till 1923–24, with intervals when the plantations were not worked at all. In the past four years the whole of Culli and Sheffield, most of Chowghat Culli and part of Governor's Shola have been clear-felled, and Sheffield has been planted up with blue gum.

Compartment.—A detailed description of compartments follows :—

Compartment I of Block VI which contained Acacia was clear-felled in part in 1920–21 and the balance in 1928–29 and was planted with blue gum in 1929–30.

Compartment number and species.	*Area in acres.*	*Year of planting and espacement.*	*Description of crop.*	*Quality class.*	*Past history.* *Year of felling.*	*Method of felling.*	*Age at felling.*	*Outturn in stacked cubic feet per acre.*	*Remarks.*
			Governor's Shola—Chowghat Culli—Block I.						
1 *Eucalyptus globulus.*	15·5	1871—6 feet by 6 feet ..	Soil—Partly Shola and partly grass land type, rich red clayey loam with large laterite boulders.	II	1882–83	..	..	..	In 1882–83—4 acres were felled realizing a revenue of Rs. 3,200.
					1889–90	..	18	4,372	
			Aspect—North and south-west		1925–26	Simple coppice.	37		In 1889–90—10·3 acres were felled probably a thinning.
			Crop—*Eucalyptus globulus* coppice of fairly good growth with Eupatorium undergrowth.		1942–43	Do.	17	11,726	
								1,442	1925–26 only the pure blue gum area in the west was felled (7 areas). The age at felling (37 years) is an average.
2 *Do.*	15·0	1871—6 feet by 6 feet ..	Soil—Partly Shola and partly grass land type; rich red clayey loam with laterite boulders.	I	1891–92	Coppice with standards.	20	6,940	
			Aspect—north and north-west		1926–28	Sample coppice.	35	2,524	
			Slope—Fairly steep.		1943–44	..	17	5,728	
			Crop—*Eucalyptus globulus* coppice of fairly good growth with Eupatorium undergrowth.						

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Governor's Shola—Block II (Culli).						
1 *Eucalyptus globulus*	9·5	1870—6 feet by 6 feet ..	Soil—Partly Shola and partly grass land type, deep red clayey loam. Aspect—South-west. Slope—Moderately steep. Crop—*Eucalyptus globulus* coppice of moderate growth with Eupatorium undergwoth.	I	1924–26 1941–42	Simple coppice. ..	.. 17–15	13,387 3,043	In 1911 there had been an accidental fire. Age when felled (1924) uncertain. Records of previous yields unreliable not worthy quoting.
2 *Do.*	9·0	1879—6 feet by 6 feet ..	Soil—Shola type; red clayey loam .. Aspect—North-west .. .. .. Slope—Moderately steep .. .. Crop—*Eucalyptus globulus* coppice of moderate growth with Eupatorium undergrowth.	II	1923–24 1924–25 1941–42	.. Simple coppice. Do.	.. 17	11,903 12,000 3,643	Age uncertain when felled in 1924. Records of previous yields unreliable and not worth quoting.
			Governor's Shola—Block III (Sheffield).						
1 *Eucalyptus globulus.*	14·8	1927—9 feet by 9 feet ..	Soil—Both Shola and grass land type; red clayey loam. Aspect—South-west to south. Slope—Gentle to steep. Crop—*Eucalyptus globulus* seedlings crop of fairly good growth, with undergrowth of Acacia and Eupatorium.	II	1906–10 1926–27 1943–44	.. Clear felling	12/16 16/19 17	3,130 4,838 5,643	Originally this was Acacia area planted in 1863 and 1883. In 1878, 15 acres were felled (compartment 1 and 2). In 1882–85 thinned yielding a revenue of Rs. 337 in 1892 worked under coppice with standards. For the purposes of the previous working plan, this compartments was subdivided into two sub-compartments. 1. (*a*) *Eucalyptus globulus* 5·8 acres *Acacia dealbeta* 0·2 acres and 1 (*b*) *Eucalyptus globulus* 6·7 acres. Reconstituted as compartment 1 now.
2 *Do.*	15·2	1927, 9 feet × 9 feet ..	Soil—both Shola and grass land type; red clayey loam. Aspect—South-west to north-east .. Slope—Moderate. Crop—*Eucalyptus globulus* seedling crop of moderate growth with undergrowth of *Acacia* and *Eupatorium*.	II	1906–10 1926–27 1944–45	.. Clear felling	12/16 15/19 17	3,130 6,040 8,395	Remarks with regard to previous fellings same as above. For the purposes of the previous working plan, these compartments were sub divided into two sub compartments. 2 (*a*) *Eucalyptus globulus*—6·0 acres 1 *Acacia dealbeta.* 0·2 acre.

										2 (b) *Eucalyptus. globulus*—7·2 acres. Reconstituted as one compartment 2 now.
				Governor's Shola—Block IV (Andy).						
1	*Do.*	9·1	About 1885, 6 feet × 6 feet. 1941–42, 9 feet × 9 feet.	Soil—Grass land type; red clayey loam Aspect—South-west. Crop—*Acacia melonoxylon* high forest of fairly good growth but in a ragged condition with scattered undergrowth of *Eupatorium*.	III	1940–41	Clear-felled ..	80	4,141	Previously as shola, with trees attached by Loranthusm, converted to bluegum in 1941–42.
2A	*Do.*	10·50	1873, 9 feet × 9 feet ..	Soil—Partly shola and partly grass land type; red clayey loam. Aspect—North to North-west. Slope-Moderate.	II	1932–33	Simple coppice	58	13,516	No records of past working but seems to have been felled over about 1889.
				Crop—Both coppice and seedling crop of *Eucalyptus globulus* with Eupatorium undergrowth'	..	1947–48	Do. ..	15	2,852	
2B	*Do.*	16·0	1873, 9 feet × 9 feet ..	Soil—Shola and grass land type; red clayey loam.	..	1930–31	Do. ..	12	12,369	There is no record of previous fellings but appears to have been felled in 1889. There was a fire in 1909. Affected by fire in February 1953.
				Aspect—North to north west. Slope—Moderate. Crop—Stocking of coppice shoots is poor and so blanks are filled up with seedlings.	..	1948–49	Do. ..	18	2,103	
3	*Do.*	9·25	Acacia 1860, 6 feet × 6 feet,	Soil—Shola and grass land type; red clayey loam.	III	1930–31	Simple coppice.	12	12,369	There is no record of previous fellings but appears to have been felled in 1889. There was a fire in 1909.
			Eucalyptus 1873, 9 feet × 9 feet 1931–32.	Aspect—West and North. Slope—Moderate. Crop—*Eucalyptus globulus* coppice of moderate growth but the leaves are all drying up, especially the tender ones, probably a form of wind damage. Undergrowth Eupatorium; Shola shrubs along the stream banks. *Acacia melonoxylon* occurs in isolated patches one of which is above the road to Nanjanad, crop poor and sparse.		1948–49	Do.	18	2,013	Affected by fire in February 1953.
				Governor's Shola—Block V (Huppatti).						
1	*Eucalyptus globulus.*	10·0	1873—9 feet × 9 feet ..	Soil—Shola and grass land type; red clayey Loam. Aspect—South. Slope—Fairly steep. Crop—*Eucalyptus globulus* coppice with some standards with sparse undergrowth of Eupatorium and shola shrubs here and there.	III	1882–83 1893–94 1939–40	No record .. Coppice .. Do. ..	.. 11 44	.. 3,706 3,305	A wind belt. The crop is left appears to be of uneven age. The compartment is exposed to wind. In 1882–83. the plantation suffered much from wind and fire.
2	*Eucalyptus globulus* with *Acacia melonoxylon* Swamp shola.	15·0	1872—9 feet × 9 feet ..	Soil—Mostly grass land type with a small bit of shola type near the swamp; red clayey loam. Aspect—South-West. Slope—Steep. Crop—*Eucalyptus globulus* coppice of moderate growth with Eupatorium undergrowth all over except in the north-east where there are some shola shrubs.	III	1882–83 1893–94 1938–39	No record .. Do.	11 45 ..	3,705 6,500 ..	In 1882–83 the plantation suffered much from wind and fire. In about 1909 the area was swept by fire.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past History. Year of felling.	Past History. Method of felling.	Past History. Age at felling.	Past History. Outturn in stacked cubic feet per acre.	Remarks.
			Governor's Shola—Block VI.						
1 *Eucalyptus globulus.*	12·10	1929–30—9 feet × 9 feet . . 1945–46—9 feet × 9 feet.	Soil—Both shola and grass land type, red clayey loam. Aspect—North. Crop—*Eucalyptus globulus* seedling crop of moderate growth with Eupatorium undergrowth.	II	1920–21 1928–29	Clear felled Acacia. Do.	56 64	1,680 . .	In 1920–21 only 2 acres were felled and the balance was felled in 1928–29. Originally a plantation of Acacia dealbata and melonoxylon planted 1864–65. Converted to bluegum in 1929–30.
2A *Do.*	6·0	1862–65—6 feet × 6 feet.	Soil—Shola type; red clayey loam with large big boulders. Aspect—North west. Slope—Steep. Crop—Eucalyptus globulus coppice.	III	1933–34 1949–50	Simple coppice. Do.	35 16	8,012 4,720	Previous yield not recorded.
2B *Do.*	5·50	1862–63—6 feet × 6 feet.	Soil—Both shola and grass land type; red clayey loam with some granite boulders. Aspect—Moderately steep. Crop—*Eucalyptus globulus* coppice Density 0·9. Canopy—Open.	III	1934–35 1949–50	Do.	. . 15	9,721 3,040	Do. . .
3A *Do.*	5·1	1870–72—6 feet × 6 feet.	Soil—Both shola and grass land type. Red clayey loam with large granite boulders. Aspect—North. Slope—Steep. Crop—*Eucalyptus globulus* coppice of fairly good growth with Eupatorium undergrowth.	I	1935–36 1951–52	Simple coppice. Do.	66 16	10,413 5,184	Previous yield not recorded.
3B *Do.*	7·5	1863–65 and 1870–72, 6 feet × 6 feet.	Soil—Both shola and grass land type; red clayey loam. Aspect—North. Slope—Steep. Crop—*Eucalyptus globulus*, probably a part of this seedling crop, about 4 acres felled in 1917–18. Moderate growth with Eupatorium undergrowth.	III	1917–18 1939–40	Do. Do.	Not known. 22	4,677 7,770	Past yield not recorded. An area of 3·9 acres felled in 1917–18 yielding 18,240 stacked cubic feet.
4 *Do.*	11·65	Do.	Soil—Shola type; red clayey loam . . Aspect—North to North-west. Slope—Steep. Crop—*Eucalyptus globulus* coppice of good growth with dense Eupatorium undergrowth.	III	1927–28 1938–39	Do. Do.	39 11	14,291 4,800	Early yields not recorded. In 1938–39 partly felled due to windfalls.

5	*Do.*	11·12	1870–72	Soil—Shola type ; red loam .. .. Aspect—North. Slope—Steep. Crop—*Eucalyptus globulus* coppice of moderately good growth, with Eupatorium undergrowth.		1929–30 1946–47	Do. ..	59 17	17,500 4,140	There are some Acacia standards in the north. Earlier yield not available.
				Governor's Shola—Block VII (Arnaikkal).					..	
1	*Eucalyptus globulus* Grass Shola.	10·50	1873—9 feet × 9 feet ..	Soil—Shola type ; red clayey loam .. Aspect—North. Slope—Fairly steep. Crop—*Eucalyptus globulus* coppice and seedling of poor and moderate growth with Eupatorium undergrowth except in the south and in the west it is mixed with shola shrubs.	III	1892–93 1937–38	Coppice with few standards.	19	4,334	About 3 acres were destroyed by fire in 1882–83. In about 1894 a fire swept the area and the coppice shoots were badly damaged.
				Governor's Shola—Block VIII (Chemanguli).						
1	*Eucalyptus globulus.*	6·5	1879—6 feet × 6 feet ..	Soil—Mostly grass land type with a little shola in the west ; fairly deep red loam. Aspect—West. Slope—Fairly steep. Crop—*Eucalyptus globulus* coppice of rather poor type with Eupatorium. ..	II	1911–12	Simple coppice.	32	6,440	The plantations is "Bacon Wood" on the Hunt Map. Prior to 1911–12 the block was worked, without system of any sort for charcoal resulting in Clanks in the vicinity of the kilns, which has been recollected now.
2	*Do.*	14·0	1879—6 feet × 6 feet. ..	Soil—Shola type ; red deep loam .. Aspect—West. Slope—Steep. Crop—Both coppice and seedling crop of rather poor type with Eupatorium undergrowth.	III	1944–45 1946–47	..	65	6,357	The plantation is "Bacon Wood" on the Hunt Map. Prior to 1911–12 the block was worked, without system. If any sort for charcoal resulting in blanks in the vicinity of the kilns which have been recollected now.
3	*Eucalyptus globulus* Grass Scrub.	11·5	1879—6 feet × 6 feet ..	Soil—Shola type ; deep loam .. .. Aspect—West. Slope—Steep. Crop—*Eucalyptus globulus* coppice and seedling crop with undergrowth of Eupatorium.	III	1947–48	..	..	8,921	Do.
	Hodgson's, Hill.	1 and 2	20·0	Soil—Shola type .. .. Aspect—West. Slope—Moderate.		..	..	..	..	Originally belonging to a private individual and these were exchanged and now they are the property of the State. Old pyrethrum areas.

MUTHINAD SERIES.

Muthinad and Brooklands.

Area.—Muthinad is 71·0 acres in extent.

Forest settlement.—Muthinad was originally notified in April 1885, and was later incorporated in the Wenlock Downs Reserved Forest notified in March 1900. It is not affected by any rights or privileges.

History.—Muthinad was formed in 1880-83 on the site of an old shola. All the compartments in Muthinad were once thinned between 1915 and 1927 and compartments 1 to 5 of Muthinad have been felled under coppice with standards.

Compartment number and species.	*Area in acres.*	*Year of planting and espacement.*	*Description of crop.*	*Quality class.*	Past history: *Year of felling.*	Past history: *Method of felling.*	Past history: *Age at felling.*	Past history: *Outturn in stacked cubic feet per acre.*	*Remarks.*
1A *Eucalyptus globulus.*	3·5	1880-83—6 feet × 6 feet.	Aspect—North-west .. .. .. Slope—Moderate. Soil—Partly shola and partly grass land type. Crop—*Eucalyptus globulus* coppice with Eupatorium undergrowth.	III	1915–16 1920–21 1928–29 1948–49	Thinning .. Clear felling .. Do. Coppice with standards.	35 40 13/48 20	3,763 3,480 9,463 5,050	Thinning among the dominent trees—Only one acre felled. Compartment divided into 1 (a) and 1 (b) in Mr. Dyson's Working Plan.
1B *Do.*	3·5	Do.	Aspect—North-West .. .. Slope—Moderate. Soil—Partly shola and partly grass land type. Crop—*Eucalyptus globulus* coppice with Eupatorium.	III	1915–16 1929–30 1948–49	Thinning .. Coppice with standards. Do.	35 14/49 19	3,763 6,579 3,360	Thinning among dominent trees.
2A *Do.*	4·50	Do.	Aspect—North-West .. .. .. Slope—Moderate. Soil—*Eucalyptus globulus* coppice with Eupatorium undergrowth.	II	1916–17 1930–31 1951–52	Thinning .. Coppice with standard. Do.	36 14/50 21	2,093 19,250 ..	There is a very small blank in the compartment. Compartment divided into 2 (a) and 2 (b) in Mr. Dyson's Working Plan.
2B *Eucalyptus globulus* grass.	3·70	Do.	Slope—Moderate .. .. .. Soil—Both shola and grass land type. Crop—*Eucalyptus globulus* coppice Eupatorium.	II	1916–17 1932–33 1951–52	Thinning .. Coppice with standards. Do.	36 16/52 19	2,093 16,913 ..	There are two small blanks in the compartment.
3A *Eucalyptus globulus.*	3·15	Do.	Aspect—North .. .. Slope—Moderate. Crop—*Eucalyptus globulus* coppice with Eupatorium undergrowth.	III	1917–18 1933–34 1952–53	Thinning .. Coppice with standards. Simple coppice.	37 16/53 19	3,863 7,420 ..	Compartment 3 divided into 3 (a) and 3 (b) in Mr. Dyson's Working Plan.
3B *Do.*	3·70	Do.	Aspect—North .. .. Slope—Moderate. Soil—Shola type. Crop—*Eucalptus globulus* coppies with Eupatorium undergrowth.	III	1917–18 1934–35 1952–53	Thinning .. Coppice with standards. Coppice ..	37 17/54 18	3,863 17,880 ..	
4A *Do.*	3·15	Do.	Aspect—North .. .. Slope—Moderate. Soil—Shola type. Crop—*Eucalpytus globulus* coppice with standards.	III	1918–19 1934–35	Thinning .. Coppice with standards.	38 16/54	3,298 12,031	Compartment 4 divided in Mr. Dyson's Working Plans into 4 (a), 4 (b) and 4 (c).

4B	Do.	3·21	Do.	Aspect—East .. .. Slope—Moderate. Soil—Shola and grass land type. Crop—*Eucalyptus globulus* coppice with standards with Eupatorium undergrowth.	II	1918–19 1935–36	Thinning ... Coppice with standards.	38 17/55	3,298 11,048	
4C	Do.	1·7	Do.	Aspect—North .. .. Slope—Moderate Soil—Shola type. Crop—*Eucalyptus globulus.*	III	Not worked	..	..	..	Badly damaged by the storm of June 1936.
5A	Do.	2·15	Do.	Aspect—North .. .. Slope—Moderate .. .. Soil—Shola type .. .. Crop—*Eucalyptus globulus* coppice with standards of good growth. Eupatorium and a few shola shrubs as undergrowth.	III	1919–20 1920–21 1936–37	Thinning .. Do. .. Coppice with standards.	39 40 56	4,435 4,380 5,719	Compartment 5 divided into 5 (*a*) and 5 (*b*) in Mr. Dyson's working plans.
5B	Do.	3·50	Do.	Aspect—North .. .. Slope—Moderate .. .. Soil—Shola type .. .. Crop—Very well grown *Eucalyptus globulus* high forest with under growth of Eupatorim and some shola shrubs.	III	1919–20 1920–21 1937–38	Thinning .. Do. .. Coppice with standards.	39 40	4,435 4,380	
6	Do. ..	6·73	Do.	Aspect—North .. .. Slope—Moderate .. .. .. Soil—Shola type .. .. .. Crop—Very well grown *Eucalputus globulus.* High forest with Eupatorium and some shola shrubs as under growth.	III ..	1921–22 1922–23	Thinning .. Do. ..	41 42	8,410 17,162	A heavy thinning. Only a portion of the compartment worked in each year.
7	Do. ..	7·95	Do.	Aspect—North-east .. .. .. Slope—Moderate .. .. Soil—Shola type .. .. Crop—*Eucalyptus globulus* high forest of very good growth with Eupatorium and some shola shrubs as undergrowth.	II	1924–25 1943–44 } 1945–46 }	Thinning	44 19	11,742 22,328	The thinning was a very heavy one. All the suppressed stuff was removed.
8	Do.	8·10	Do.	Apsect—North-east .. .. .. Slope—Rather steep. Soil—Shola type. Crop—*Eucalyptus globulus* high forest of good growth and Eupatorium and some shola shrubs as undergrowth.	II ..	1923–24 1946–47	Thinning .. Felling ..	43 66	10,800 15,630	Fairly heavy thinning.
9	Do.	6·82	Do.	Aspect—North .. .. Slope—Steep .. .. Soil—Shola type .. .. .. Crop—Well grown *Eucalyptus globulus* high forest with Eupatorium and some shola undergrowth.	II ..	1925–26 1946–47	Do. .. Do. ..	45 21	11,466 23,091	There are outer crops of rock in one or two places. Thinning carried out in 1925–26 was heavy and so the area looks as if it was worked under coppice with standards system. Wind belt left unthinned.
10	Do.	6·95	Do.	Aspect—North-west .. .. .. Slope—Steep .. .. Soil—Shola type. Crop—*Eucalyptus globulus* high forest of good growth with Eupatorium and some shola shrubs as undergrowth.	I ..	1926–27 1946–47	Thinning .. Felling ..	46 20	9,700 19,457	A wind belt is left in the north and no thinning was made in this.

Brooklands, Bingham and Lascelles.

Area.—**The total area is 55·5 acres.**

Forest settlement.—All area included in the Wenlock Downs reserve forest notified in March 1900.

History.—The three plantations were bought in at auction in 1875 for arrears of assessment. Brooklands (and probably Bingham and Lascelles also) were originally planted by a private owner, a Missionary in 1862. After 1926 compartments 1 to 5 were planted with Eucalyptus hardwood and compartments 6 to 10 were planted with bluegum. Compartments 1 to 5 will be felled and converted to bluegum.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history: Year of felling.	Past history: Method of felling.	Past history: Age at felling.	Past history: Outturn in stacked cubic feet per acre.	Remarks.
			Brooklands, Bingham and Lascelles.						
			Bingham.						
1 *Eucalyptus eugeniodes* *Acacia dealbata* Grass.	4·1 0·8 0·1 5·00	1926—6 feet × 6 feet ..	Aspect—South .. .. Slope—Moderate .. .. Soil—Grass land type. Crop—*Eucalyptus eugeniodes.*	III	1925–26	Clear-felling ..	About 60	3,600	The figures given are *Acacia dealbeta* planted in the sixties.
			Brooklands.						
2 *Eucalyptus eugenioides* *Acacia dealbeta* ..	4·1 0·9 5·00	1927—6 feet × 6 feet ..	Aspect—West .. .. Slope—Gentle to moderate .. .. Soil—Grass land type .. .. .. Crop—*Eucalyptus eugenioides.*	II	1926–27	Clear-felling Thinning.	64	4,666	The figures given are for *Acacia dealbeta* planted in 1862.
3 *Eucalyptus eugenioides* *Acacia dealbeta* .. Grass	4·7 0·2 0·7 5·6	1928—6 feet × 6 feet ..	Aspect—South-west and north .. .. Slope—Moderate. Soil—Shola type. Crop—*Eucalyptus eugenioides.*	II	1927–28	Clear-felling ..	65	6,024	Do.
4 *Eucalyptus pilularis.* *Acacia dealbeta* ..	1·3 3·7 5·0	1929—6 feet × 6 feet ..	Aspect—West .. .. Slope—Gentle. Soil—Both shola and grass land type, black loam. Crop—*Eucalyptus pilularis.*	II	1928–29	Do.	66	6,252	Do.
5 *Eucalyptus pilularis.* *Acacia dealbeta* ..	3·3 2·5 5·8	1930—6 feet × 6 feet ..	Aspect—North .. .. Slope—Moderate. Soil—Grass land type. Crop—*Eucalyptus pilularis.*	II	1929–30	Do. ..	67	5,400	The figures given are for *Acacia dealbata* planted in 1862. There are a few ***Eucalyptus globulus*** **trees in the Acacia areas.**

6	*Eucalyptus globulus* Grass.	5·26	1931	6 feet × 6 feet	Aspect—West .. .. Slope—Moderate. Soil—Grass land type. with little shola type Crop—*Eucalyptus globulus*.	III	1930–31	Do.	..	68	7,408	The figures shown are for *Acacia dealbata* planted in 1862.
7	*Eucalyptus globulus*.	3·25	1932	6 feet × 6 feet	Aspect—North and west .. .. Slope—Moderate. Soil—Mostly grass land type. Crop—Well grown *Eucalyptus globulus* seedling crop.	III	1931–32	Do.	..	69	12,000	The figures given are for *Acacia dealbata* and a few bluegum planted in 1862.
8	*Eucalyptus globulus* with few *Eucalyptus punctata*.	3·3	1933	9 feet × 9 feet	Aspect—West and north .. .. Slope—Gentle. Soil—Grass land types. Crop—*Eucalyptus globulus*.	III	1932–33	Do.	..	70	4,141	The figures given are for *Acacia dealbata* planted in 1862. This was first planted with *Eucalyptus punctata* but failed completely owing to forest and it was then planted with *Eucalyptus globulus*.
9	*Eucalyptus globulus*.	4·9	1934	9 feet × 9 feet	Aspect—East .. .. Slope—Gentle. Soil—Mostly grass land type, black loam. Crop—*Eucalyptus globulus*.	III	1933–34	Do.	..	71	2,292 5,187	The figures are for *Acacia dealbata* and bluegum respectively planted in 1862.
10	*Do.* ..	6·20	1935	9 feet × 9 feet	Aspect—West .. .. Slope—Moderate. Soil—Grass land type. Crop—*Eucalyptus globulus*.	II	1934–35	Do.	..	72	5,980	The figures given is for *Acacia dealbata* and a few bluegum planted in 1862.
					Lascelles.							
11	*Do.*	9·2	....		Aspect—West. .. .. Slope—Moderate. Soil—Grass land type. Crop—*Eucalyptus globulus with Acacia dealbata*.	III	1934–35	Do.	..	..	..	This compartment has never been worked. There are a few bluegum trees in the compartment. This was proposed for conversion to bluegum but it has been retained under Chief Conservator's Miscellaneous No. 190, dated 27th April 1935. Suffered badly in the storm of June 1936. Ornamental trees were to be planted in it under the previous Working Plan. This will be felled and regenerated in 1953. Ornamental trees are to be planted round the periphery.

Working plan for the Nilgiris Division Snowdon.

Area.—The total area is 230·2 acres made up of 188·30 acres of bluegum.

The total planted area is 188·30 acres.

Forest settlement.—*Snowdon* was constituted reserved forest in G.O. No. 478, Revenue (Forest No. 79), dated 28th April 1885, embodied in Board's Proceedings No. 1473, Forest No. 273, dated 18th May 1885.

Marlimund addition was reserved in G.O. No. 1321, Revenue (Forest No. 172), dated 1st December 1884, embodied in Boards' Proceedings Forest No. 244, dated 7th December 1907.

The bridlepath from Snowdon house to Dadabatta passing through the area is a right of way. Since settlement it has been converted into the Kotagiri road which has fallen into disuse again due to the shorter Doddabetta road.

The road running parallel to the southern boundary of the Marlimund Addition Reserved Forests is a right of way. So are the foot-paths running along the southern and western boundaries.

History.—The origin of the plantation is obscure. Some Acacia was planted in 1863. Most of the records relate to Norwood plantation which has been absorbed in the Government House Ground, and has vanished as a plantation. The hardwoods date from 1910–12. These have been converted to bluegum.

The *Acacia dealbata* areas in compartments, 8, 4, 5 and 6 of Block II were clear felled and planted with bluegum between 1921 and 1926 and those in compartments 1 and 2 of Block II between 1933 and 1936.

Compartment number and species.	*Acreage.*	*Year of planting and espacement.*	*Description of crop.*	*Quality class.*	Past history. *Year of felling.*	Past history. *Method of felling.*	Past history. *Age at felling.*	Past history. *Outturn in stacked cubic feet per acre.*	*Remarks.*
			Snowdon Block I.						
1 *Eucalyptus globulus.*	4·2	1910 6 feet × 6 feet ..	Aspect—South-west .. .. .. Slope—Moderate. Soil—Grass land type. Crop—*Eucalyptus globulus* replanted.	II	1930 1951–52	Thinning	20 21	1,455 ..	Originally *Eucalyptus* it was converted to bluegu
2a *Do.*	3·2	1910 6 feet × 6 feet ..	Aspect—South and south-west .. .. Slope—Moderate. Soil—Grass land type. Crop—*Eucalyptus globulus* of moderate growth.	II	1919 1929–30 1929–30 1950–51	Partial light thinning. Thinning ... Rethinned .. Do. ..	9 19 20 21	78 tons. 1,896 148 ..	Originally *Eucalyptus pillerlasis* plantation. Set divided into 2A and 2B. Bluegum planted in 1951.
3 *Do.*	4·6	1910 6 feet × 6 feet .. 1942–45 9 feet × 9 feet ..	Aspect—South .. .. Slope—Steep. Soil—Grass land type. Crop—*Eucalyptus globulus.*	II	1941	..	31	..	Originaily *Eucalyptus eugenoides* converted to bluegum in 1942–43.
4 *Do.*	6·9	1910 6 feet × 6 feet ..	Aspect—South and south-west .. .. Slope—Moderate. Soil—Grass land type. Crop—*Eucalyptus propinqua seedling crop* of moderate growth with shola shrub as undergrowth all over excepting in the north where it is Eupatorium. Density—0·8. Canopy—Nearly close. Average height—71' Age when measured—25.	II	1936	Thinned ..	26	2,700	Originally *Eucalyptus eugenoides* and *Eucalyptus propinqua* converted into bluegum in 1950.

5	Do.	7·60	1910 6 feet × 6 feet ..	Aspect—South .. .. Slope—Gentle. Soil—Grass land type. Crop—*Eucalyptus globulus*.	II	1919 1931–32 1949	Thinned .. Do. .. Clear felled ..	9 21 39	147 stems 2,560 ..	Originally *Eucalyptus acimenides* converted to bluegum in 1950.
6	Do.	..	1910 6 feet × 6 feet, 1953 9 feet × 9 feet.	Aspect—South .. .. Slope—Gentle. Soil—Grass land type. Crop—*Eucalyptus globulus*.	II	1952	..	..	..	Originally *Eucalyptus paniculata* converted to bluegum in 1953.
7	Do.	4·5	1910 6 feet × 6 feet, 1942.	Aspect—South .. .. Slope—Moderately steep. Soil—Grass land type. Crop—Very poorly grown *Eucalyptus gloubulus*.	II	1941	..	..	..	Originally *Eucalyptus eugenoides* converted to bluegum in 1942.
3	Do.	..	1910 6 feet × 6 feet ..	Aspect—South .. .. Slope—Moderate. Soil—Grass land type. Crop—Very poorly grown *Eucalyptus*.	II	..	..	–	..	Originally *Eucalyptus eugenoides* converted to bluegum in 1942.
9	Do.	5·10	1910 6 feet × 6 feet, 1953 9 feet × 9 feet.	Aspect—South-west .. .. Slope—Steep. Soil—Grass land type. Crop—*Eucalyptus*.	II	1952	..	42	..	Originally *Eucalyptus punctata converted to* bluegum in 1953.
				Snowdon Block II.						
1A	*Eucalyptus globulus*.	4·5	1934 9 feet × 9 feet ..	Aspect—North and west .. .. .. Slope—Moderate. Soil—Shola type. Crop—*Eucalyptus globulus*.	III	1916–17 1933 1948–49	Simple coppice clear felling. Do.	9 17 15	4,333 2,974 4,805	Reconstituted as compartment 1.
1B	Do.	..	..	..	III	1916–17 1934–35	.. ..	9 18	4,333 925	
2	*Eucalyptus globulus shola*.	16·2	1936 9 feet × 9 feet ..	Aspect—North and east .. .. .. Slope—Moderate. Soil—Both shola and grass land type. Crop—*Eucalyptus globulus*.	III	1917–20 1935–36 1944–45	Simple coppice. Clear felling	Not known. 18 17	6,100 3,065 6,263	Reconstituted into one compartment 2.
3	*Eucalyptus globulus*.	8·5	1922–23 6 feet × 6 feet. ..	Aspect—South-east to south-west .. Slope—Moderate. Soil—Grass land type and red clayey loam. Crop—Fairly well grown *eucalyptus globulus*.	III	1918–21 1938–39	Clear felling	20 Not known.	4,362 2,638	The figures given in columns 10 to 13 are for Acacia. The year of planting not known. Divided into— 3*a*. Acacia. 4·5 Grass .. 3·3 Shola .. 3·9 11·7 3.5 *Eucalyptus Globulus*. 4·2

Compartment number and species.	Acreage.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Snowdon Block II—cont.						
4 *Eucalyptus globulus*	17·8	1921–23 6 feet × 6 feet ..	Aspect—South-west and west .. .. Slope—Moderate to steep. Soil—Grass land type, red clayey loam. Crop—Well grown *Eucalyptus* seedling crop with Eupatorium.	III ..	1918–21 1940–41	Clear felled	Not known. ..	4,352 3,681	
5a *Do.*	9·00	1925 and 1926 6 feet × 6 feet.	Aspect—All .. .. Slope—Moderate to steep. Soil—Grass land type; red clayey loam. Crop—*Eucalyptus globulus* Eupatorium.	I ..	1921–24 1943–44	Clear felled .. Do. ..	Not known. 12/48	7,219 6,256	Remarks same as above. Now divided into—5a, 5b, 5a. Eucalyptus Globulus 9·00. 5b, *Eucalyptus Globulus* 12·0.
5b *Do.*	12·00	Do.	Do.	I	1943–44	Do.	18/19	7,587	
6a. b. & c. *Do.*	24·0	1921–23 6 feet × 6 feet ..	Aspect—South, north, west and north .. Slope—Steep. Soil—Both shola and grass land type, red clayey loam. Crop—*Eucalyptus globulus*	I ..	1921–23 1941–42	Do. .. Do. ..	Not known. 20	2,924 4,952	Year of planting Acacia not known yield figures unreliable subdivided into 6a. b, & c 8·0 acres each.
7 *Acacia melanoxylon* Shola .. .. Grass land ..	1·2 10·0 8·0 19·2	Years of planting not known.	Aspect—North and south. .. Slope—Steep. Soil—Grass land type. Crop—*Acacia melanoxylon* high forest.						
8 *Eucalyptus globulus.*	8·1	1922 6 feet × 6 feet ..	Aspect—South and south-east .. .. Slope—Mostly steep. Soil—Shola type, reddish black loam. Crop—*Eucalyptus globulus* crop with Eupatorium.	I ..	1922–23 1939–40	Clear felled	Not known. 17	2,924 3,800	The small patch of bluegum near the Government house gate is self sown. This area was added to Snowdon reserve in 1918. It was therefore not dealt with in Mr. Cox's plan. This acacia was felled with compartment 6 in 1922–23. Bluegum and Pinus Khassiya planted in 1922 and 1923. The latter has failed. But divided into 8a, 8b, 2·60 and 2·50.

Marlimund Block III.

1 *Eucalyptus globulus.*	6·3	1860	Aspect—North Slope—Moderate. Soil—Shola type, moist and deep. Crop—*Eucalyptus globulus* coppice.	III	1913–14 1928–29 1944–45	Simple coppice.	53 15 16	1,360 4,937 6,804	Partly felled in 1908. Area and yield not known. Age uneven, the yield for 1913–14 felled doubtful.
2A Do.	3·7	1927	Aspect—South Slope—Moderate. Soil—Shola type. Crop—*Eucalyptus globulus* with some shola shrubs and Eupatorium.	II	1908 1913–14 1926–27 1944–45	Simple coppice Clear-felling.	Not known. 13 17	Not known. .. 5,699 5,280	The figures given here are for Acacia. Compartment 2 was divided into 2a and 2b in Mr. Dyson's Working Plan.
2B Do.	4·5	1860	Aspect—South Slope—Moderate. Soil—Shola type. Crop—*Eucalyptus globulus* with shola-shrub and Eupatorium.	II	1908 1914–15 1927–28 1944–45	Simple coppice clear-felling.	Not known. 15 17	Not known. 6,500 7,245	Originally planted with Acacia.
3 Do.	4·2	1926 9 feet × 9 feet and one acre in 1928 9 feet × 9 feet.	Aspect—East Slope—Steep Soil—Shola type Crop—*Eucalyptus globulus*.	II	1922–23 1925–26 1942–43	Clear-felled Do. ..	62 65 16	78,000 11,674 5,120	Only one acre felled. Remaining 3·5 acres felled. The area felled 1922–23 (one acre) was planted with Pinus merkhasi which totally failed. This was planted with bluegum in 1928. Originally planted with *Acacia melanoxylon* in 1860.
4 *Eucalyptus globulus* Acacia grass.	12·80	....	Aspect—South and west Slope—Gentle to steep. Soil—Grass land type. Crop—*Eucalyptus globulus*.	III	Not known. 1953–54	..	..	..	The bluegum is probably self-sown.
5 *Eucalyptus globulus.*	4·2	1883 9 feet × 9 feet	Aspect—West Slope—Moderate. Soil—Grass land type. Crop—Fairly well grown *Eucalyptus globulus* coppice with Eupatorium.	III	1914–16 1931–32 1943–44	Simple coppice. Do. ..	3 17	10,391 4,743 6,430	These two compartments 5a and 5b lie in Marlimund catchment area. At one time the Municipality objected to forest operations being carried on here. Compartment 5 was subdivided into 5a and 5b in Mr. Dyson's Working Plan and reconstituted to compartment 5 now.

CAIRNHILL SERIES.

Cairnhill Reserve.

Area.—The total area is 446·4 acres. *Eucalyptus globulus* planted area is 268·8 acres.

Forest settlement.—Cairnhill reserve was notified as reserve forest in G.O. No. 1321, Revenue (Forest No. 172), dated 1st December 1884 (B.). No. 49, dated 30th January 1902 (S. No. 116-D of Ootacamund measuring 1·43 acres and containing the Subrahmanyaswami and Rameswara Swami temples is an enclosure within the reserve with right of access by footpath. A right also exists for the Todas of Kakarimund to water their cattle at a fixed point in the Fairlawns stream.

An extension to Cairnhill addition was notified as reserved forest in G.O. No. 266, Revenue (Forest No. 49), dated 14th March 1902, embodied in B.P. No. 110, dated 26th March 1902. A path in the reserve leading to the above temples is a right of way.

Fernhill reserve was notified as reserved forest in G.O. No. 476, Revenue (Forest No. 129), dated 29th May 1891, embodied in B.P. No. 303, Forest, dated 11th July 1891.

A right of way for pedestrians and horses exists on the path through the middle of Cairnhill reserved forest.

History.—The bluegum plantations on Cairnhill are on the site of the old Bathrishola, which appears to have escaped destruction long after most of the sholas near Ootacamund had been felled for fuel. Most of the old shola was, however, cut down by the end of 1878, planting of bluegum began in 1877 and by 1881, 60 acres are said to have been stocked (the present block II, compartments 1 to 10). In 1883–84 a further area of about 70 acres was planted (the present block III and block II, compartments 11 to 21). Felling began in 1884–85 and part of the plantation was regularly worked on a ten-year rotation. The rest was more or less neglected, but during the past twenty years or so the whole are under Eucalyptus (except block III) has been felled over, and practically all is now simple coppice. Acacia and Callitris areas in compartments 3, 4 and 9 were clear-felled and planted with bluegum after 1927. The Conifer and Casuarina areas planted in 1885 and the following years by Mr. Gamble, who also carried out about this time creeper cutting and improvement fellings in the shola areas.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Cairn Hill Block I.						
1 *Eucalyptus globulus.*	0·9	Not known	Soil—Shola type, Blackish loam of good depth.	..	..	..	..	..	No record to show when *Eucalyptus globulus* was planted but it may be about 40 years old. The area was burnt in 1934.
Grass	0·5		Slope—Moderately steep.						
Shola	32·0		Crop of *Eucalyptus globulus* reasonably well grown with Eupatorium undergrowth.						
Scrub	1·2								
	34·6								
2 *Cryptomeria Japanica, Pinus longifolia cupressus macrocarpa* and *lawsoniana.*	5·3	....	Soil—Both shola and grassland type, red clayey loam.	..	1915–16	Thinning ..	30	580	*Cryptomeria* was given a light thinning in 1924–25. There are a few *Acacia dealbata* inside the shola. There is a temple here.
			Aspect—North-east.		1921–22	Windfall ..	..	1,440	
			Slope—Moderate.		1922–23	Road site clearing.	..	1,338	
Swamp	0·7		Crop—*Cryptomeria japonia* there are two very small blanks. In the north crop is open and poor and near the road there a few *acacia dealbata* and *Eucalyptus globulus.* Undergrowth sparse Eupatorium. *Pinus longifolia*—poor and often with dense growth Eupatorium.		1924–25	Thinning ..	–	120	
Shola	8·0								
	14·0								
3 *Eucalyptus globulus.*	8·15	1927	Soil—Shola type; deep red clayey loam.	I	1926–27	Clear felling of *Acacia.*	41	6,572	Original crop of *Acacia* was planted in 1885–86.
			Aspect—North.						
			Slope—Moderate.		1943–44		17	12,300	
			Crop—Fairly well grown. *Eucalyptus globulus* coppice with *Acacia* undergrowth in the north, shola shrubs in the south.						
1A (i) *Eucalyptus globulus.*	3·13	1931–32	Soil—Grassland type, red clayey loam.	II	1930–31	Clear felled ..	31	6,494	Crop is slightly damaged by wind.
			Aspect—South.		1944–45				

				Slope—Gentle. Crop—Seedling growth of good quality with undergrowth of Eupatorium.				14	9,048	Original crop was Callitris planted in 1885–86.
4A (ii) Do.	2·9	1932–33	.. .. ..	Soil—Mostly grass land type, red clayey loam. Aspect—South. Slope—Gentle to moderate. Crop—*Eucalyptus globulus* seedling crop, vigorous ; dense undergrowth of Eupatorium.	I	1931–32 1947–48	Clearfelled .. Do. ..	45 16	3,440 10,800	Callitris was clear-felled and *Eucalyptus globulus* planted. The original planting of Callitris was done in 1865–66.
(iii)	3·23	1933–34	.. .. ..	Soil—Mostly grassland type ; red clayey loam. Slope—Gentle to moderate. Crop—*Eucalyptus globulus* seedling crop, vigorous ; dense undergrowth of Eupatorium.	II	1932–33 1947–48	Do. .. Do. ..	47 15	4,500 9,511	Originally Callitris planted in 1885–86. Clearfelled and planted with blue-gum in 1933–34.
4A (iv) *Eucalyptus globulus* Callitris Grass.	8·03		....	Soil—Shola type in the north ; elsewhere grassland type, red clayey loam. Aspect—North and east. Slope—Gentle to moderate .. .. Crop—*Eucalyptus globulus* seedlings crop, vigorous with undergrowth of Eupatorium.	II	1933–34 1950–51	Do. .. Do. ..	48 17	7,800 6,800	There are some out-crops of rock. There is some Callitris growth. Originally planted with Callitris in 1885–86 and replaced by *Eucalyptus globulus* in 1933–34.
4B (1) *Cupresus torulosa* (2) *Pinus insignis* (3) *Acacia melanoxylon.* Shola .. .. Grass .. .. Swamp	0·8 1·1 0·4 6·1 0·2 1·6 10·3	1900 1907 1885–86	.. ..	Soil—Both shola and grass land type, red clayey loam. Slope—Gentle to moderate. Crop—Moderate with Eupatorium under growth under *Pinus* and *Acacia* but under cupressus undergrowth none.	1921–22		Windfallen ..	..	1,740	This has not been worked.
.. .. 6 *Acacia dealbata* .. Grass .. .. Swamp .. .. Shola	.. 0·4 1·7 1·0 11·7 14·8		....	Patta land.						
7 Shola .. .. Grass	27·2 1·2 28·4									
8 Shola .. .. Grass	28·2 10·5 38·7									The grassland contains scattered growth of scrub.
9A *Cupressus macrocarpa* and *torulosa.* Shola .. .. Grass	24·3 0·8 5·3 30·4		....	Soil—Both grassland and shola type and red loam with gravel. Aspect—All. Slope—Moderate to fairly steep. Crop—*Cupressus macrocarpa* and *torulosa* high forest, reasonably well grown forming a complete canopy with practically no undergrowth. The tree growth is best near the Picnic corner and poorer higher up. The trees are heavily branched laterally.	..	..	..	..	..	The area was swept by fire in 1905–06. There are two *Eucalyptus globulus trees* in the top of the hillock. A sample plot of *Cupressus torulosa* at Picnic corner. The Curpressus area will be retained.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Past history. Method of felling.	Past history. Age at felling.	Past history. Outturn in stacked cubic feet per acre.	Remarks.
			Cairn Hill Block I—cont.						
9B (i) *Eucalyptus globulus.*	2·5	1929–30	Soil—Mostly shola type, red clayey loam. Aspect—South. Slope—Moderate. Crop—Seedling crop of *Eucalyptus globulus*, fairly well grown with sparse undergrowth of Eupatorium.	I	1928–29 1944–45	Clearfelled	40 16	4,023 9,522	Originally Callitris area planted in 1889–90 converted to *Eucalyptus globulus.*
9B (ii) *Do.*	2·75	1930–31	Soil—Mostly shola type ; red clayey loam. Aspect—South. Slope—Moderate. Crop—Seedling crop of *Eucalyptus globulus* fairly well grown with sparse undergrowth of Eupatroium.	I	1929–30 1944–45	Do. ..	41 15	13,440 7,898	Originally Callitris area, planted 1889–90 converted to *Eucalyptus globulus.* There is a sample plot of Callitris.
10 (1) Casuarina *quadivalis,* (2) Calitris, (3) Cupresses.	16·7	About 1886	Soil—Mostly grass land type ; red clayey loam. Aspect—All. Slope—Moderate to steep. Crop—High forest of the species named in column (1) Cupressus is poor near the Grant Duff road, elsewhere moderate. Casuarina is poor Cupressus few. Only under Casuarina there is Eupatorium, elsewhere none.		Not worked.	..	..	..	Date of planting not known probably by Mr. Gamble in and after 1886. As it is not easily accessible it is not proposed for conversion to bluegum but will be retained as it is.
Grass	3·8								
	20·5								
11 Shola .. .. Grass	37·3 7·3								
	44·6								
			Cairn Hill Block II.						
1 *Eucalyptus globulus* *Cupress macrocarpa.*	4·28	1877–80—6 feet × 6 feet.	Soil—Shola type, deep red gravelly loam. Aspect—South-east. Slope—Moderate. Crop—*Eucalyptus globulus* coppice with 2 or 3 *Eucalyptus siberiana* with sparse undergrowth of evergreen shrubs. Eupatorium is intruding from the south.	II	1884–85 1894–95 1904–05 1922–23 1941–42	.. ..	7 2 9 18 19	No record. Do. 6,122 9,194 6,015	
			In the north-east corner Cupressus *macrocarpa* forms an underwood.		..	..	..	..	Drains have been cut in the plantation.
2 *Eucalyptus globulus.*	5·3	1877–80—6 feet × 6 feet.	Soil—Shola type, reddish clayey loam with admixture of gravel. Aspect—South-east. Slope—Moderate. Crop—*Eucalyptus globulus* coppice vigorously growing with sparse undergrowth of shola species Eupatorium intrusive.	I	1884–85 1894–95 1904–05 1922–23 1941–42	.. ..	7 9 9 18 19	No record. Do. 6,122 9,194 6,015	A part of the Compartment in the south was accidentally burnt in 1934 and so it was felled and the coppice regrowth is satisfactory. Blanks were refilled with seedlings.
3 Do.	5·05	1877–80—6 feet × 6 feet. 1950–51—9 feet × 9 feet ..	Soil—Shola type ; reddish clayey loam. . . Aspect—South. Slope—Moderate to steep. Crop—Dense *Eucalyptus globulus* coppice reasonably well grown and Eupatorium.	III	1888–89 1898–99 1908–09 1922–23 1934–35 1949–50	Simple coppice.	11 10 10 14 .. 15	13,666 8,245 6,346 9,024 .. 5,762	The compartment was felled before the prescribed year owing to accidental fire.

4	Do.	7·73	1877-80—6 feet × 6 feet ..	Soil—Shola type ; red gravelly loam and in some places black loam. Aspect—South. Slope—Moderate. Crop—Mixed crop of young *Eucalyptus globulus* coppice and seedling, about two years old. The crop is flourishing and undergrowth consists of Eupatorium. The entire compartment got burnt accidentally in 1934-35 ; when it was felled over and blanks refilled.	II	1927-28 1934-35 1951-52	Simlpe coppice. The figures for previous felling not known.	22 7 17	7,362 .. 6,404	
5	Do.	7·25	1877-80—6 feet × 6 feet ..	Soil—Shola type ; reddish clayey loam. Aspect—South. Slope—Moderate to steep. Crop—Portion of the compartment consists of young coppice after recent accidental fire in 1934-45. In the rest very well grown coppice with Eupatorium undergrowth and some evergreen shrubs. Blanks filled up with seedlings in 1935.	III	1889-90 1899-00 1909-10 1929-30 1947-48	Simple coppice.	12 10 10 20 18	6,509 8,294 4,535 5,040 4,833	
6	Do. Shola	4·0 0·8 4·8	1877-80—6 feet × 6 feet ..	Soil—Shola type ; red gravelly loam, in some places black loam. Aspect—West. Slope—Steep. Crop—Fair quality *Eucalyptus globulus* coppice with dense Eupatorium and a few shola shrubs as undergrowth.	II	1891-92 1901-02 1912-13 1930-31 1944-45	Simple coppice.	14 10 11 18 ..	10,224 6,336 5,670 8,940 ..	There are some Cupressus trees over less than ¼ of an acre, near the block line in the south.
7	*Eucalyptus globulus.*	6·0	1877-80—6 feet × 6 feet.	Soil—Shola type ; black loam and in some places red loam. Aspect—South to west. Slope—Moderate to steep. Crop—*Eucalyptus globulus* coppice with occasional small blank, with dense Eupatorium undergrowth.	I	1886-87 1896-97 1906-07 1928-29 1943-44	Simple coppice.	9 10 10 22 15	7,668 6,341 4,873 10,124 6,750	There are several out crops of rock. About five trees are left as standards near the reserve line.
8	Do.	5·2	1877-80—6 feet × 6 feet ..	Soil—Shola type ; red or black deep loam with admixture of gravel. Aspect—West to north-west. Slope—Moderate. Crop—A very well-grown *Eucalyptus globulus* coppice with dense undergrowth of Eupatorium and scattered shola shrubs.	I	1892-93 1902-03 1923-24 1941-42	No record. Simple coppice.	.. 10 21 18	 6,618 12,844 6,015	A small portion of the compartment in the north-west is rather poorly stocked.
9	Do.	4·45	1877-80—6 feet × 6 feet ..	Soil—Shola type ; deep black loam. Aspect—West. Slope—Gentle to steep. Crop—*Eucaypius globulus* coppice fairly well grown. Dense undergrowth of Eupatorium and occasional shola shrubs.	II	1890-91 1900-01 1911-12 1930-31 1944-45	Simple coppice.	13 10 11 19 14	6,184 6,941 7,440 5,465 5,662	
10	Do.	3·50	1877-80—6 feet × 6 feet.	Soil—Shola type ; deep black loam. Aspect—West to north-west Crop—Flourishing *Eucalyptus globulus* coppice with dense undergrowth of Eupatorium and occasional shola shrubs.	II	1893-94 1903-04 1917-18 1923-24 1942-43	No record.	 14 6 19	 6,034 1,817 6,761	

Compartment number and species	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age of felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Cairn Hill Block II—cont.						
11 *Eucalyptus globulus* with some *Eucalyptus siberiana*.	5·25	1883–84	Soil—Shola type ; deep red loam. Aspect—South-west. Slope—Moderate. Crop—Very well grown *Eucalyptus globulus* coppice, nearly fully stocked with undergrowth of Eupatorium in the north and south. Underwood of *Acacia dealbata* and shola shrubs in the extreme south.	III	1918–19 1953–54	Simple coppice.	35 25	12,515 ..	
12 *Do.*	4·75	1883–84	Soil—Shola type ; deep red loam. Aspect—South to south-west. Slope—Moderate. Crop—Consists of remarkably well grown *Eucalyptus globulus* coppice, nearly fully stocked, with evergreen growth in the south and *Acacia* underwood in the north.	II	1919–20 1953–54	Simple coppice.	36 34	19,299 ..	
13 *Do.*	5·25	1883–84	Soil—Shola type ; brownish loam of medium depth. Aspect—South to west. Slope—Gentle to steep. Crop—Poorly grown *Eucalyptus globulus* coppice with evergreen undergrowth.	II	1920–21 1939–40	Simple thinning.	37 19	13,707 5,989	
14 *Do.*	3·4	1883–84	Soil—Shola type ; red gravelly loam. Aspect—North. Slope—Steep. Crop—Fairly well grown *Eucalyptus globulus* coppice with some *acacia* undergrowth towards west and sparse shola shrubs throughout.	II	1921–22 1940–41	Simple thinning.	38 19	12,971 7,660	
15 *Do.*	5·35	1883–86	Soil—Shola type ; red deep loam .. Aspect—South to south-west .. .. Slope—Gentle to steep. Crop—Fairly vigorous *Eucalyptus globulus* coppice with dense undergrowth of Eupatorium.	I	1921–22 1939–40	Simple thinning.	38 18	19,503 7,000	
16 *Eucalyptus globulus* (*Cupressus macrocarpa*).	2·7	1883–86	Soil—Shola type ; reddish loam .. Aspect—South-east .. .. .. Slope—Gentle .. .. Crop—A dense crop of *Eucalyptus globulus* coppice in flourishing condition with Eupatorium undergrowth.	II	1916–17 1932–33 1949–50	Do.	33 16 17	18,557 14,875 3,778	
17 *Do.*	3·5	1883–86	Soil—Shola type ; reddish loam .. Aspect—South to south-west .. .. Slope—Moderate .. .. Crop—Well grown *Eucalyptus globulus* coppice with Eupatorium undergrowth	II	1914–15 1932–33 1947–48	Do.	32 18 15	18,585 10,677 6,223	About ¼ of an acre was burnt in 1934 but damage was slight.

18 *Eucalyptus globulus.*	6·45	1883–86	.. .. ..	Soil—Shola type ; deep red loam .. Aspect—South east and west .. .. Slope—Moderate .. .. .. Crop—A dense crop of well grown *Eucalyptus globulus* coppice with dense growth of Eupatorium undergrowth.	II	1914–15 1931–32 1945–46	Do.	31 17 14	17,795 11,925 6,900	
19 *Eucalyptus globulus* with a few *Eucalyptus siberiana.*	8·2	1883–86	.. .. ..	Soil —Shola type ; deep red loam .. Aspect—South west .. .. .. Slope—Fairly steep .. .. .. Crop—A dense crop of *Eucalyptus globulus* coppice with dense undergrowth of Eupatorium.	II	1915–16 1933–34 1949–50	Do.	33 18 16	15,689 8,641 4,800	
20 *Eucalyptus globulus* with some *Eucalyptus siberiana.*	3·75	1883–86	.. .. ..	Soil—Shola type ; red loam .. .. Aspect—South to west .. .. .. Slope—Gentle to steep .. .. .. Crop—Vigorously grown *Eucalyptus globulus* coppice in the northern half and in the south it is satisfactory. Undergrowth consists of sparse evergreen shrubs and occasional Eupatorium but in many places there is hardly any undergrowth.	I	1907–08 1927–28 1944–45	.. .. ..	24 20 17	14,300 10,512 7,392	
21 *Eucalyptu globuls*	3·5	1883–86	.. .. ..	Soil—Shola type ; red loam .. .. Aspect—South west to west .. .. Slope—Moderate .. .. .. Crop—Vigorously growing *Eucalyptus globulus* coppice with undergrowth of Eupatorium generally and in some places some Callitris. A small portion of the area in the south was burnt in 1934–35 and the resulting coppice is not promising.	I	1913–14 1930–31 1944–45	Simple coppice. Do. Do.	30 17 14	13,167 14,469 9,598	A part of the compartment was felled in 1907–08 but the yield is not recorded. There are a few Eucalyptus siberiana in the north-east corner adjoining the bridle path.
22 *Cryptomeria japonica.*	1·5	1886	.. .. ..	Soil—Shola type ; red loam .. .. Aspect—South. Slope—Moderate. Crop—Cryptomeria high forest, moderate growth. A few trees are attacked by Loranthus. There are a few blanks. Under growth—Eupatorium with a few shola shrubs in the blanks.	..	1935–36	Thinned ..	49	11,880	Planted in 1886. Has not been thinned.
23 Shola	15·1		— —	Soil—Shola type ; red loam. Aspect—South west. Slope—Gentle to steep.						
24 Do.	10·7		— ..	Soil—Shola type ; red loam. Aspect—South west. Slope—Moderately steep.						
25 *Cryptomeria japonica.* Grass .. .. Shola	2·1 1·7 14·2 18·0	1886	— — — —	Soil—Shola type ; red loam Aspect—West to south east. Slope—Gentle to steep. Crop—Cryptomeria is attacked by Loranthus and it is rather poor. There are a few *Cupressus macrocarpa* adjoining the Reserved Forest line. The undergrowth in plantation is Eupatorium.		Not worked. 1936–37.	Thinned ..	[illegible]	4,200	
Sho'a	21·8		....	Soil—Shola type ; red loam .. .. Aspect—West. Slope—Moderate to steep.	..	..	..	..		Along the reserve forest line there are some tree of *Cupressus Macrocarpa.*

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Cairn Hill Block III.						
1 *Eucalyptus globulus* mostly.	4·50	1883–84	Soil—Grassland; shola type Aspect—All but north. Slope—Gentle to moderate. Crop—*Eucalyptus globulus* high forest mixed with other Eucalyptus species.	II	Not worked.				
2 Do.	6·00	1883–84	Soil—Grassland; shola type Aspect—All but north. Slope—Gentle to moderately steep. Crop—*Eucalyptus globulus* high forest with other Eucalyptus species.	III	Do.	..	..	..	Contains one square chain of *Eucalyptus maculata* plot (not to be felled).

BAIKIE AND MADANNA.

Area.—The total area is 83·8 acres.

Forest settlement.—Baikie Reserve (including both plantations was notified as reserved forest in G.O. No. 1407, Revenue (Forest No. 182), dated 18th December 1884, embodied in B.P. No. 86 (Forest No. 16), dated 14th January 1885.

An addition to Baikie Reserved Forest was notified in G.O. No. 1075, Revenue (Forest No. 157), dated 21st September 1885, embodied in B.P. No. 2856 (Forest No. 564), dated 13th October 1885.

Both are now absorbed in the Wenlock Downs Reserve Forest.

History.—The early history of Baikie is obscure. There is no mention of it prior to 1874. The evidence of old cultivation and the occasional occurrence of cinchona coppice lead to the surmise that it may have been originally an experimental cinchona garden.

Thirty-three acres known as " Old Baikie " were planted by Major Jage in 1874 with Eucalyptus Globulus, and a few Eucalyptus siberiana, and in 1882 the remainder of the area (" New Baikie ") was purchased for Rs. 2,059 from Colonel Shaw and planted with Eucalyptus globulus, Eucalyptus siberiana and Acacia decurrens.

Madanna plantation is on the site of an old shola, sold by auction in 1859 for fuel supply to Ootacamund, and bought by one Madana, hence the name. Planting began in 1860 and by 1862 was fully stocked with Eucalyptus and Acacia.

Prior to 1912, both plantations were irregularly worked for charcoal. Since that date, the whole of both have been felled over for firewood, and Acacia areas have been planted up with bluegum. The stand is now coppice (in parts young uncoppiced growth) of bluegum, with, in places, a dense Acacia undergrowth.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
1 *Eucalyptus globulus.*	8·7	1860–62	Aspect—South Slope—Moderate to steep Soil—Shola type moist, deep and fertile. Crop—Chiefly bluegum coppice and partly bluegum seedlings crop with dense. Acacia undergrowth in the western half and Eupatorium on the eastern half with Acacia underwood.	III	1876 1882 1897 1925–26 1942–43	Not known Do. Partly. Felled—not known. Simple coppice Uneven.	.. 17	.. 13,666 5,724	A few bluegum outside the fire line are also found. In 1926 and 1927 some blanks and acacia areas were refilled with bluegum.

2	Do.	12·8	1860–62	Aspect—South .. .. Slope—Gentle to fairly steep .. .. Soil—Shola type, moist, deep, rich black loam.	III	1876 1882 1895	Not known. Do. 5 acres were felled.			
				Crop—Bluegum coppice and seedlings crop with dense undergrowth of Acacia. Towards the east Eupatorium is dense and spreading.		1896 1943–44	3 acres were felled. Simple coppice.	.. 18	13,293 5,362	
3	*Eucalyptus globulus* with a few *Eucalyptus Siberiana.*	13·0	1923	Aspect—North-west .. .. Slope—Moderate Soil—Grass land type, poor shallow loam. Crop—*Eucalyptus globulus* crop with undergrowth of *Acacia dealbata.*	III	1899–1900 1920–21 1940–41	Not known .. Clear felling .. Do. ..	17 21 17	Not known. 14,662 5,323	Acacia planted in 1882–83 at 6′×6′. After felling in 1920–21 planted with bluegum in 1923.
4	*Eucalyptus globulus* ..	7·50	1882–83—6 feet × 6 feet.	Aspect—North-west .. .. .. Slope—Moderately steep .. .. Soil—Grass land type, poor, shallow reddish loam. Crop—*Eucalyptus globulus* coppice fairly vigorous; with dense undergrowth of Acacia in some places forming an underwood.	III	1896–97 1919–20 1938–39	Simple coppice. Do. ..	14 23 19	4,927 6,808 5,485	Prior to 1882 the area was under Cinchona cultivation. The yield is for IV4 and IV5.
5	Do.	8·50	1882–83—6 feet × 6 feet ..	Aspect—North-west .. .. .. Slope—Moderately steep .. .. Soil—Grass land type poor, shallow reddish loam. Crop—*Eucalyptus globulus* coppice fairly satisfactory, with dense undergrowth of Acacia and few patches of Eupatorium.	III	1896–97 1919–20 1938–39	Do. Do. Do.	14 23 19	4,927 7,473 5,485	The area was previously cultivated with Cinchona. The yield is for IV4 and IV5 together.
6	Do.	12·0	1874—6 feet × 6 feet ..	Aspect—West .. .. Slope—Moderately steep .. .. Soil—Shola type, red clayey loam, moist and deep. Crop—*Eucalyptus globulus* coppice ..	II	1886–87 1903–05 1917–18 1936–37 1953	Do. Do. Do. Do. Do.	12 18 13 19 16	6,766 7,316 8,967 Being felled. Do.	
7	Do.	13·0	1874—6 feet × 6 feet ..	Aspect—West, south-west .. .. Slope—Moderate .. .. .. Soil—Shola type, red or black, deep moist loam. Crop—*Eucalyptus globulus* coppice. One year old fairly flourishing, dense Eupatorium.	II	1885–86 1902–04 1916–17 1953	Do. Do. Do. Do. Do.	11 17 14 19 17	5,155 7,196 5,291 2,671 ..	
	Do.	12·75	1874—6 feet × 6 feet ..	Aspect—North-west, west .. .. Slope—Gentle to moderate .. .. Soil—Shola type, moist deep, red loam with boulders. Crop—*Eucalyptus globulus* coppice two years old vigorous; dense under growth of Eupatorium.	III	1884–85 1900–01 1913–14 1934–35 1948–49	Do. Do. Do. Do. Do.	10 16 13 21 14	6,293 7,484 8,838 5,816 4,331	Replanting blanks was done in 1935.

KETTI SERIES.

Area.—Total area of the series is 94·40 (0·6 acre of blank, 2·6 acres of scrub, 1·9 acres of Conifers and 0·1 acre of Grevellia robusta).

Ketti Reserve Forest.

Forest settlement.—Reserved as the Ketti Valley Reserved Forest in G.O. No. 3401, Revenue, dated 11th March 1912 (B. P. Forest No. 59, dated 19th March 1914.)

History.—Formed by Mr. Cox in 1912 as an experiment to find a timber yielding species of Eucalyptus suited to the locality. As it is found that good timber is not obtained from these trees, and as it is not not also economical to maintain them for timber it is proposed to convert them into bluegum during the period of this plan.

Lovedale Reserved Forest.

Area.—An area of 18·0 acres in Lovedale West Reserved Forest and 10·0 acres raised by tuckle is included in the series.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Past history. Year of felling.	Past history. Method of felling.	Past history. Age at felling.	Past history. Outturn in stacked cubic feet per acre.	Remarks.
1 *Eucalyptus paniculata*	4·3	1910–12—6 feet × 6 feet ..	Aspect—South-east and east .. .. Slope—Gentle. Soil—Grass land type, stiff red clay, fairly deep with a few outcrops of rock. Crop—*Eucalyptus paniculata* in good condition, free of undergrowth.	II	1925–26	Thinning ..	14	869	
2 *Eucalyptus crebra* ..	3·9	1910–12—6 feet × 6 feet.	Aspect—East and south-east .. .. Slope—Moderate. Soil—Grass land type, stiff red clay, fairly deep. Crop—*Eucalyptus crebra* plantation poor, badly grown in places. Undergrowth consists of Dodonaea, ferns, Rhodomyrtus and shola shrubs fairly dense with a patch of *Acacia dealbata* regrowth on the west.	II					
3 *Eucalyptus globulus.*	4·8	1910–12—6 feet × 6 feet ..	Aspect—South-east .. .. .. Slope—Moderate. Soil—Grass land type, stiff red clay, fairly deep, moist adjoining the stream, with a few outcrops of rock. Crop—*Eucalyptus globulus* poor in condition with Eupatorium.	III	1942	Felled	..	..	Since *Eucalyptus Crebra* was growing very badly it was replanted with Bluegum in 1943.
4 *Eucalyptus propinqua.*	3·6	1910–12—6 feet × 6 feet ..	Aspect—South-east, east and north-east. Slope—Gentle. Soil—Grass land type, stiff red clay, very poor. Crop—*Eucalyptus propinqua*; condition better in the south than in the north, free of undergrowth except for a few small patches of regrowth of *acacia dealbata* and melanoxylon, callitris and shola shrubs by the roadside.	II	1926–27	Thinning ..	15	1,900	

5 *Eucalyptus pilularis.*	3·9	1910–12—6 feet × 6 feet ..	Aspect—North .. .. Slope—Moderate to steep. Soil—Grass land type, stiff red clay, fairly deep and moist adjoining the stream. Crop—*Eucalyptus pilularis* vigorously growing in good condition thinned in 1936–37. Growth is better on stream bank. A few more suppressed trees are found which could have been removed during the last thinnings scattered evergreen scrub such as Dodonaea, Rodomyrtus and ferns in a narrow patch along roadside and Sparse Eupatorium elsewhere form the under growth.	II	About 1920. 1936.	Thinned .. Do. ..	9 16	Not known. 3,000	Received a thinning about 1920.
6 *Eucalyptus acmenoides.*	3·7	1910–12, 6 feet × 6 feet ..	Aspect—North-east .. .. .. Slope—Moderately steep. Soil—Grass land type, stiff red clay, fairly deep. Crop—*Eucalyptus acmenoides*, fairly well grown, free of undergrowth along the roadside, with evergreen scrub mixed with a few shola shrubs in the middle; in the north near the stream is dense Eupatorium.	II	1925–26	Thinning ..	14	400	
7 *Eucalyptus hemiphloea.*	4·3	1910–12, 6 feet × 6 feet ..	Aspect—North .. .. Slope—Gentle. Soil—Grass land type, stiff red clay, fairly deep. Crop—*Eucalyptus hemiphloea* of poor growth, forked and crooked in many places. Evergreen scrub such as Dodonaca, Rhodomyrtus. Berberis and ferns mixed with scattered shola shrubs in the main undergrowth.	II	..	..	..	..	There are two or three trees of *acacia melanoxylon* in the crop.
8 *Eucalpytus eugenioides.*	4·1	1910–12, 6 feet × 6 feet ..	Aspect—South and south-west .. .. Slope—Very gentle. Soil—Grass land type, stiff red clay, fairly deep. Crop-*Eucalyptus eugenioides*, well grown, in good condition, and free of undergrowth.	II	1924–25	Thinning ..	13	1,155	There are two or three trees of *acacia melanoxylon* in the crop.
9 *Eucalyptus punctata.*	4·1	1910–12, 6 feet × 6 feet ..	Aspect—South and south-west .. .. Slope—Gentle. Soil—Grass land type, stiff red clay and fairly deep. Crop—*Eucalyptus punctata* of fairly good growth and condition free of undergrowth except for a small patch of ever green scrub such as Dodonæa and Rhodomyrtus in the south-east corner and a small patch of *acacia dealbata* regrowth in the middle.	II	1925–26	Do. ..	14	1,056	A few trees of *Eucalyptus eugenioides* are found mixed in the crop.
10 *Cupressus torulosa* mixed with callitris and a few Fncalyptus mainly *Eucalyptus eugenioides* and *globulus* evergreen scrub.	4·9	....	Aspect—Various .. .. Slope—Moderate. Soil—Stiff red clay, poor. Crop—*Cupressus torulosa* and callitris found in groupes containing saplings and poles of *Eucalyptus eugenioides* and a few bluegum in fairly good condition.	II	..	..	..	..	Originally planted with oaks in 1923, but proved a complete failure. There is a long line of cupressus trees along the southern boundary.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
11 *Eucalyptus globulus.*	7·50	1945	Crop—Eucalyptus globulus coppice ..	II	..	..	..	..	This area is half of the leased area regenerated in 1945.
12 *Do.*	7·50	1945	Do. ..	II	..	..	..	..	Do.
13 *Do.*	5·00	1950	Do. ..	II	..	..	..	..	This area is a part of the leased area of 8·0 acres and that of 2 acres raised in 1950.
14 *Do.*	5·00	1950	Do. ..	II	..	..	..	..	Do.
			Lovedale.						
1 *Eucalyptus globulus.*	8·0	1950	Aspect—South .. .. Slope—Gentle Soil—Grass land type. Crop—*Eucalyptus globulus.*	II	..	Not worked so far.			
2 *Do*	2·0	1950	Aspect—North .. .. Slope—Gentle. Soil—Grass land type. Crop—*Eucalyptus globulus*	II	..	..	..	..	
3 *Do.*	6·0	1951	Aspect—South to south-east .. Slope—Gentle to steep. Soil—Black loamy soil, deep and moist.	II	..	Not worked so far.		..	Originally it was a plantation of wattle and as wattle failed bluegum was planted in 1951. Total area is 18·0 acres. This has been divided into three compartments for felling and management purposes.
4 *Do.*	6·0	1951	Crop—*Eucalyptus globulus* with wattle mixed.	II	..	..	..	..	
~o.	6·0	1951	Do.	II	..	Not worked so far.			

BANDY SHOLA SERIES.

Area.—The total area is 197·14 acres.

The total planted area is 197·14 acres.

Bandyshola.

Forest settlement.—Notified in G.O. No. 1321, Revenue (Forest No. 172), dated 1st December 1884, embodied in B.P. No. 4276 (Forest No. 446), dated 12th December 1884.

The cart road from Coonoor to Dolphin's Nose and Hallakarai is an admitted right of way.

History.—Planted in the sixties with *Acacia melanoxylon* and *Acacia dealbata*; of the early history little is known. At one time the *Acacia melanoxylon* appears to have been exploited for railway sleepers. From about 1890 onwards the plantation was fairly regularly worked for fuel. *Acacia melanoxylon* which originally appears to have formed the main crop largely died out leaving large blanks. From 1910–20 the felled compartments were planted up with bluegum and from 1924 onwards Hardwood Eucalyptus have been planted to replace the felled Acacia.

The hardwood Eucalyptus will be felled and converted into bluegum as they are not useful as timber.

Bleak house.

***Forest settlement*.—Notified in G.O. No. 322, Revenue (Forest No. 51), dated 14th March 1895, embodied** in B.P. No. 1020 (Forest No. 189), dated 27th March 1885.

History.—Planted between 1856 and 1863 with *Acacia melanoxylon* and dealbata, chiefly the former. *Acacia melanoxylon* has largely died out and *Acacia dealbata* has filled up the blanks caused. The early history of the plantation is obscure, it appears to have been irregularly worked from time to time between 1909 and 1920 the whole plantation was clear-felled (except for a few bluegum standards). Compartment 10 felled in 1919–20 was planted up with bluegum in 1920. The rest of the plantation which stood as Acacia coppice and root sucker growth with occasional bluegum standards has been clear-felled and planted with hardwood Eucalyptus species from 1930–31.

As the hardwood has not proved to be a good timber as was originally thought all the compartments will be felled and converted into bluegum during the period of this plan.

Springfield.

Forest settlement.—Notified in G.O. No. 1321, Revenue (Forest No. 172), dated 1st January 1884, embodied in B.P. No. 4276 (Forest No. 446), dated 12th December 1884.

History.—Planted in the sixties with *Acacia melanoxylon* and *Acacia dealbata*. The former has almost entirely died out. *Eucalyptus gloulus* is found in patches, probably planted to fill blanks. First felled in 1883 as coppice with standards. Compartment 1 was felled in 1926–27 and was planted with hardwoods in 1927. Compartments 2 and 3 felled in the 1927 monsoon were planted with hardwoods in 1928. Compartments 4 and 5 which stood as Acacia coppice with patches of bluegum coppice, were clear felled in 1928–29 and planted with *Eucalyptus pilularis*.

As it is now known that these hardwoods are not of use as timber the entire plantations not already converted, that is compartments 2 and 3 will be felled and converted into bluegum.

Tent Hill.

Forest settlement.—Included in Ghat reserve, Notified in G.O. No. 1407, Revenue (Forest No. 182), dated 18th December 1884, embodied in Board's proceedings No. 86 (Forest No. 16), dated 14th January 1885.

No rights in the planted area. The Coonoor Municipality license areas with and adjoining the plantation for plague and health camps.

History.—Planted in 1888–90 at a cost of Rs. 505. The area was clear-felled in 1944–45 and planted with bluegum.

Compartment number and species.	*Area in acres.*	*Year of planting and espacement.*	*Description of crop.*	*Past history.* Quality class.	*Past history.* Year of felling.	*Past history.* Method of felling.	*Past history.* Age at felling.	*Past history.* Outturn in stacked cubic feet per acre.	*Remarks.*
			Bandyshola.						
1 *Eucalyptus globulus.*	8·55	1924–25—6 feet × 6 feet. 1952—11 feet × 11 feet.	Aspect—South-east .. .. .. Slope—Gentle. Soil—Shola type, red clayey, loam, deep and moist. Crop—*Eucalyptus globulus* in good condition with dense Eupatorium as undergrowth.	II	1887–88 1903–04 1923–24 1933–34 1951–52	Clear felling .. Do. .. Do. .. Thinning .. Clear felling ..	.. 16 20 9 27	1,807 2,761 2,163 1,694 ..	Originally planted in the 1860's with *Acacia melanoxylon* mainly and some *Acacia dealbata*. In 1951–52 it was clear-felled and regener rated with bluegum.
2 Do.	1·90	1924–25—6 feet × 6 feet. 1952—11 feet × 11 feet.	Aspect—South .. .. .. Slope—Gentle. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus* in good condition with a few trees of *Eucalyptus paniculata*. Sparse Eupatorium is the undergrowth.	II	1902–03 1923–24 1933–34 1952–53	Clear felling .. Do. .. Thinning .. Clear felling ..	.. 21 9 28	4,253 1,856 1,315 ..	Originally planted in the 1860's with *Acacia melanoxylon*. and dealbata with a small patch of *casuarina subarosa*. Two or three trees are found damaged by wind. In 1951–52 it was clear-felled and regenerated with bluegum.

Bandyshola—cont.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
3 *Eucalyptus Eugenioides.*	3·4	1925–26—6 feet × 6 feet.	Aspect—South .. .. Slope—Moderate. Soil—Shola type, red clayey, loam deep and moist. Crop—*Eucalyptus eugenioides* in very good condition, free of undergrowth except in the east where there is fairly dense Eupatorium and along the northern boundary a few Acacia dealbata.	II	1892–93 1908–09 1924–25 1934–36	Clear felling .. Do. .. Do. .. Thinning ..	.. 16 16 10	1,877 2,311 4,255 3,899	Originally planted in the 1860's with Acacia.
4 Do.	3·6	1925–26—6 feet × 6 feet.	Aspect—South-west .. .. .. Slope—Moderate. Soil—Shola type, red clayey loam most and deep. Crop—*Eucalyptus eugenioides* in good condition with undergrowth of Eupatorium dense along the stream and scattered elsewhere.	II	1925–26 1934–36	.. .. Thinning ..	15 10	2,022 2,275	Originally planted with Acacia in 1860's. Earlier yields not recorded.
5 *Eucalyptus Eugenioides* and *Eucalyptus paniculata.*	1·8	1925–26—6 feet × 6 feet.	Aspect—North-west .. .. .. Slope—Pretty steep. Soil—Shola type, red clayey loam, deep and moist. Crop—Consists of *Eucalyptus paniculata* in fairly good condition with sparse regrowth of Acacia dealbata all over.	II	1894–95 1910–11 1925–26 1934–36	Clear felling .. Do. .. Do. .. Thinning ..	.. 16 15 10	2,933 7,042 663 1,591	Originally planted with Acacia in 1860's. There is one *Eucalyptus punctata* tree in the crop. Two trees are found damaged by wind.
6 *Eucalyptus eugenioides.*	2·9	1925–26—6 feet × 6 feet.	Aspect—Almost level .. .. .. Slope—Almost level. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus eugenioides* in good condition except for some damage by wind. Undergrowth is Eupatorium mixed with a few shoots of *Acacia dealbata.*	II	1894–95 1909–10 1924–25 1934–36	Clear felling .. Do. .. Do. .. Thinning ..	.. 15 15 10	2,288 3,185 3,088 2,604	Originally planted with Acacia in 1860's.
7 *Eucalyptus punctata.*	1·8	1925–26—6 feet × 6 feet.	Aspect—South-east .. .. .. Slope—Moderate. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus punctata* in good condition except some damage by wind with fairly dense Eupatorium mixed with a few shoots of *Acacia dealbata* in the east as undergrowth. A few blue gum trees are found in the crop in the south along stream bank.	II	1924–25 1934–36	Clear felling .. Thinning ..	16 10	3,086 1,269	Originally planted with Acacia in the 1860's.
8 *Eucalyptus punctata.* *Eucalyptus globulus.* Swamp	4·9 0·7 0·4 6·0	1924–25—6 feet × 6 feet.	Aspect—South-east and west .. .. Slope—Moderate. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus punctata* in good condition with almost pure. *Eucalyptus globulus* in a small patch near the stream. Regrowth of *Acacia dealbata* except in the east where Eupatorium is the undergrowth.	II	1888–89 1907–08 1923–24 1933–34	Clear felling .. Do. .. Do. .. Thinning ..	.. 19 16 9	2,412 2,663 3,148 1,079	Do.

9	*Eucalyptus punctata.*	3·2	1924–25—6 feet × 6 feet.	Aspect—South-east .. .. .. Slope—Moderate. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus punctata* in good condition except for a few trees badly forked. Half a dozen trees of *Eucalyptus paniculata* and a few blue gum trees are found in the crop. Sparce Eupatorium with a few shoots of *Acacia dealbata* and shola shrubs form the undergrowth.	II	1885–86	..	..	..	There is one *Pinus longifolia* tree reserved as standard. A few trees of *Acacia dealbata* are found in the crop. Originally planted with Acacia in the 1860's.
						1900–01	Clear-felling ..	14	2,689	
						1923–24	Do. ..	23	1,760	
						1933–34	Thinning ..	9	1,439	
10	*Eucalyptus globulus.*	4·03	1916-17—9 feet × 9 feet.	Aspect—South-west .. .. Slope—Moderate to gentle. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus* coppice, faliry vigorous in growth and in good condition except for some blanks. Eupatorium is the undergrowth all over except in the east where it is evergreen scrub, viz., Dodanaea and Rhodomyrtus mixed with shola shrubs and ferns.	II	1894–95	..	..	1,474	Originally planted with Acacia in the 1860's.
						1911–12	Clear-felling ..	17	4,584	
						1932–33	Simple coppice.	16	4,101	
						1946–47	Do.	14	6,388	
11	*Do.*	2·63	1916-17—9 feet × 9 feet.	Aspect—South, south-west .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* coppice and seedling crop in promising condition. Eupatorium in the east. Evergreen scrub composed of Dodonaea, Rhodomyrtus and ferns in the middle and regrowth of *Acacia dealbata* in the west.	II	1895–96	..	..	1,652	Do.
						1913–14	Clear-felling ..	18	4,232	
						1923–24	Simple coppice.	17	4,865	
						1948–49	Do.	15	5,288	
12	*Do.*	3·25	1917-18—9 feet × 9 feet.	Aspect—South .. .. Slope—Moderate. Soil—Shola type, red clayey loam of good depth and moist. Crop—*Eucalyptus globulus* coppice in promising condition. Dense Eupatorium and evergreen scrub consisting of Dodonaea, Rhodomyrtus and ferns in the north-west.	II	1916–17	Clear-felling ..	19	5,584	Originally planted with Acacia in the 1860's. Earlier yield not known.
						1934–35	Simple coppice.	17	5,000	
						1948–49	Do.	14	5,785	
13	*Do.*	1·62	1916-17—9 feet × 9 feet.	Aspect—South .. .. Slope—Steep to moderate. Soil—Shola type, red clay loam and deep. Crop—*Eucalyptus globulus* with Eupatorium.	II	1915–16	Clear-felling ..	16	6,394	
						1936–37	Do. ..	20	7,883	
						1952–53	Do. ..	16	..	
14	*Eucalyptus globulus* coppice.	1·50	1916-17—9 feet × 9 feet.	Aspect—South .. .. Slope—Gentle. Soil—Shola type, red clay loam and deep. Crop—*Eucalyptus globulus* coppice in promising condition with several small blanks about and with a few wind falls. Eupatorium mixed with Dodonaea shola shrubs and ferns is the undergrowth.	II	1915–16	Clear-felling ..	17	2,461	
						1935–36	Simple coppice.	19	10,891	
						1951–52	Do.	16	..	

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history: Year of felling.	Past history: Method of felling.	Past history: Age at felling.	Past history: Outturn in stacked cubic feet per acre.	Remarks.
			Bandyshola—cont.						
15 *Eucalyptus globulus.*	3·38	1917–18—9 feet × 9 feet.	Aspect—South to south-east .. .. Slope—Gentle to moderate. Soil—Shola type, red clay loam, deep and moist. Crop—*Encalyptus globulus* in good condition but poorly stocked with shola shrubs mixed with Eupatorium as undergrowth in the north.	II	1916–17 1942–43	Clear-felling .. Do. ..	16 25	3,081 6,363	Originally planted with Acacia in 1860's. Earlier yeilds not known.
16 *Do.*	1·80	1917–18—9 feet × 9 feet.	Aspect—South .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in good condition but poorly stocked with many blanks containing *Acacia dealbata* shola shrubs mixed with Eupatorium.	III	1916–17 1942–43	Clear-felling .. Do. ..	16 26	4,524 3,933	Originally planted with Acacia in 1860's. Damage by wind to trees is observed.
17 *Do.*	1·60	1917–18—9 feet × 9 feet.	Aspect—South .. .. .. Slope—Almost level. Soil—Shola type, red clay loam, deep and moist. Crop—Recently felled. A number of blanks occur.	III	1936–37 1952–53	Simple coppice. ..	19 16	5,475 ..	
18 *Do.*	1·80	1916–17—9 feet × 9 feet.	Aspect—South-west .. .. .. Slope—Gentle to steep. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in good condition but poorly stocked with Eupatorium as undergrowth.	II	1912–13 1938–39	Clear-felling .. Do. ..	16 22	6,216 5,850	Originally planted with Acacia in 1860's. Earlier yields not recorded.
19 *Do.*	8·8	1938—9 feet × 9 feet ..	Aspect—East and south-east .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyputs globulus.*	III	1917–18 1938–39	Clear-felling .. Do. ..	20 21	2,528 2,184	Originally planted with Acacia in 1860's. A few bluegum were planted in 1919–20, but all failed. Earlier yields not recorded. In 1938–39 the compartment was felled and planted with bluegum.
20 *Do.*	4·25	1939—9 feet × 9 feet. ..	Aspect—South and south-west .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus.*	II	1917–18 1939–40	Clear-felling .. Do. ..	18 22	1,666 2,186	Planted in 1860's. Appears to have been fitted for planting bluegum in 1919–20, but no planting was done. There is a very small grassy blank in the south-west corner. Earlier yields not known. In 1939–40 the compartment was clear-felled and planted with bluegum.

21 *Do.*	4·30	1919–20, 9 feet × 9 feet.	Aspect—North .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in good condition better growth along the road but poorly stocked with undergrowth of shola shrubs mixed with Eupatorium and shoots of *Acacia dealbata.*	III	1917–18 1940–41	Clear-felling .. Do. ..	16 23	3,842 7,000	Originally planted with Acacia in 1860's. Earlier yields not recorded. A few *Acacia melanoxylon* trees were found in the crop which were felled in 1940–41.
22 *Acacia dealbata* coppice.	2·00	....	Aspect—North .. .. Slope—Moderate to steep. Soil—Shola type, red clay loam, deep and moist. Crop—*Acacia dealbata* coppice growth, fairly dense except for several small blanks with sparce Eupatorium mixed with a few shola shrubs as undergrowth.	III	..	..	..	..	Planted in the 1860's. Past yield not recorded. Half a dozen *Acacia melanoxylon* trees are found in the north-east corner. Herring borne drains are found in the long strip of swamp towards compartments 21 and 22. To be felled in 1962–63 and clothed with blue gum.
23 *Eucalyptus globulus.*	2·00	1919–20, 9 feet × 9 feet.	Aspect—North .. .. Slope—Steep. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in good condition, but poorly stocked with shola shrubs as undergrowth except for a small patch of *Acacia dealbata* in the south-east.	II	1887–88 1901–02 1917–18 1941–42	Coppice with standards. Almost clear-felling. Clear-felling .. Do. ..	.. 14 16 24	941 4,550 3,433 6,486	Originally planted with Acacia in 1860's.
24 *Do.*	5·63	1919–20, 9 feet × 9 feet.	Aspect—North .. .. Slope—Steep. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in good condition, fairly well stocked, with undergrowth of shola shrubs and *Acacia dealbata* except in the north where Eupatorium and *Acacia dealbata* occur.	II	1887–88 1903–04 1917–18 1941–42 1944–45 and 1945–46	Coppice with standards. Almost clear-felling. Clear-felling .. Do. ..	.. 16 14 24/28	4,008 4,550 3,621 4,988 1,379 1,379	Originally planted with Acacia in 1860's. The M.F.C. camp is in the compartment.
25 *Eucalyptus paniculata.*	2·7	1926–27, 9 feet × 9 feet.	Aspect—North .. .. Slope—Moderate. Soil—Shola type, red clay loam, very deep. Crop—*Eucalyptus paniculata* in good condition, growth better in the south with a few trees damaged by wind and some trees badly forked. Undergrowth is regrowth of *Acacia dealbata* with a few shola shrubs and sparce Eupatorium.	II	1925–26 1936–37	Clear-felling .. Thinning ..	17 10	1,853 1,191	Originally planted with Acacia in 1860's Records of earlier fellings not reliable.
26 *Eucalyptus eugenioides.*	2·8	1926–27, 9 feet × 9 feet.	Aspect—North .. .. Slope—Moderate. Soil—Red clay loam. Crop—*Eucalyptus eugenioides* in good condition, with better growth along the old forest road in the south and with regrowth of *Acacia dealbata* and sparce Eupatorium as undergrowth. Some trees are badly forked.	II	1925–26 1936–37	Clear-felling .. Thinnings ..	Not known. 10	2,269 1,855	Originally planted with Acacia in the 1860's. Results of earlier fellings not known. Heavy thinning in 1936.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Bandyshola—cont.						
27 *Eucalyptus eugenioides*.	1·09	1926-27, 9 feet × 9 feet.	Aspect—North-east .. .. Slope—Moderate. Soil—Red clay loam. Crop—*Eucalyptus eugenioides* of uniformly good growth with some re-growth of *Acacia dealbata*. Eupatorium and shola shrubs.	II	1925–26 1936–37	Clear-felling .. Thinning ..	18 10	2,736 3,150	Originally planted with Acacia in 1860's. Results of earlier fellings not known. Heavy thinning in 1936.
Eucalyptus eugenioides cryptomeria japonica shola.	5·08	Do.	Aspect—North to north-east .. .. Slope—Steep to moderate. Soil—Red clay loam with a few out crops of rock in the steep portion. Crop—*Eucalyptus eugenioides* fairly well stocked and in good condition except for some wind damages with sparce Eupatorium mixed with a few shoots of *Acacia dealbata* and shola shrubs as undergrowth.	II	1925–26 1936–37	Clear-felling .. Thinning ..	15 10	3,085 1,338	Originally planted with Acacia in 1860's, *Crytomeria japonica* over one acre, poor growth. Acacia regrowth in the cryptomeria area cut back in 1936. Results of earlier fellings not known. Heavy thinning in 1936.
29 *Eucalyptus paniculata*.	2·4	1927–28, 9 feet × 9 feet.	Aspect—North .. .. Slope—Moderate to steep. Soil—Red clay loam with a few out crops of rock. Crop—*Eucalyptus paniculata* in fairly good condition except for a few badly forked trees, better growth in the south with shola shrubs all over.	II	1926–27 1936–37	Clear-felling .. Thinning ..	17 9	2,065 1,950	Planted with Acacia in 1860's. Earlier yields not recorded. Very heavy thinning in 1936.
30 Do.	3·20	Do.	Aspect—North .. .. Slope—Steep. Soil—Red clay loam. Crop—*Eucalyptus paniculata* in fairly good condition, better growth in the north with shola shrubs as undergrowth.	II	1926–27 1936–37	Clear-felling .. Thinning ..	18 9	1,311 1,725	Do.
			Bleakhouse.						
Eucalyptus pilularis	7·60	1930–31, 9 feet × 9 feet.	Aspect—South-east, west and north-west. Slope—Very steep. Soil—Red clay loam with boulders fairly deep and moist. Crop—*Eucalyptus pilularis* in good condition, but branchy in many cases. Eupatorium is the undergrowth, dense along the stream and in the north-east and scanty elsewhere.	II	1929–30 1936–37	Clear-felling of Acacia and one or two blue gum standards. Thinning ..	27 7	2,882 780	Planted between 1856 and 1863 with Acacia. Was originally divided into 7 compartments, but was divided into 10 under Mr. Cox's working plan of 1914. It is not therefore possible to give details of yield for each compartment.

2	Do	6·4	1931-32, 9 feet × 9 feet.	Aspect—South-east and south .. .. Slope—Steep to very steep. Soil—Red clay loam, fairly deep and moist with a few boulders. Crop—*Eucalyptus pilularis* in good condition and of good height growth; *Acacia dealbata* forms undergrowth and in places underwood mixed with Eupatorium in a narrow patch.	II	1930-31 1936-37	Clear-felling of Acacia with few blue gum standards. Thinning ..	25 5	3,626 1,662	**Taking the whole block the average yield per acre in the rotation ending 1891 was 1,300 cubic feet (coppice with standards). In the next rotation (clear-felling) the yield was 2,447 cubic feet per acre.**
3	Do.	6·20	1932-33, 9 feet × 9 feet.	Aspect—South .. .. Slope—Steep to very steep. Soil—Red clay loam, fairly deep and moist with a few boulders. Crop—*Eucalyptus pilularis* in good condition with Eupatorium.	II	1931-32 1936-37	Clear-felling of Acacia with a few blue gum coppice and one or two blue gum standards. Thinning ..	34 4	4,045 982	Do.
	Eucalyptus punctata.	4·40	1933-34, 9 feet × 9 feet.	Aspect—South and south-west .. .. Slope—Steep to very steep. Soil—Red clay loam, fairly deep and moist with a few boulders. Crop—*Eucalyptus punctata* in good condition.	II	1932-33	Clear-felling of old Acacia coppice with a few blue gum standards.		1,783	Do.
5	Do.	5·40	1934-35, 9 feet × 9 feet.	Aspect—South .. .. Slope—Steep to very steep. Soil—Red clay loam and fairly deep with large boulders. Crop—*Eucalyptus punctata* mixed with sparce *Eupatorum Dodonaea* and ferns are the main undergrowth.	II	1933-34	Clear-felling of old Acacia coppice and blue gum coppice.	34	4,845	*See* remarks above. The portion between the old forest road and the cart-track contains a few *Acacia dealbata* and blue gum trees.
6	Do.	5·7	1935-36, 9 feet × 9 feet.	Aspect—South .. .. Slope—Steep. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus punctata* above cart-track planted in 1936-37. Below the cart-track when planting was done in 1935-36, the saplings are promising, free of any undergrowth, except for a few *Acacia dealbata* shoots.	II	1913-14 1934-35	Clear-felling .. Do. ..	23 21	3,485 2,130	Do.
7	*Eucalyptus puntcata* *Eucalyptus globulus* coppice.	3·8 1·0 4·8	1936-37, 9 feet × 9 feet.	Aspect—North and south .. .. Slope—Steep. Soil—Shola type, red clay loam, fairly deep and moist mixed with boulders. Crop—*Eucalyptus punctata* planted in 1936-37. Coppice of *Eucalyptus globulus* one year old very promising with undergrowth of Eupatorium. *Acacia dealbata* regrowth and a few shola shrubs.	II	1913-14 1935-36	Do. .. Do. ..	23 22	8,513 12,442	**Do.**
8	*Eucalyptus eugenioides.*	4·60	1937-38, 9 feet × 9 feet.	Aspect—West to north-west .. .. Slope—Steep. Soil—Shola type, red clay loam fairly deep with a few boulders. Crop—*Eucalyptus eugenioides.*	II	1916-17 1936-37	Do. Do.	.. ..	2,447 2,974	*See* **remarks above.**
9	Do.	4·60	Do.	Aspect—North-east, north, north-west and west. Slope—Steep. Soil—Shola type, red clay loam. Crop—***Eucalyptus eugenioides.***	II	..	..	..	[illegible]	

Compartment number and species.	*Area in acres.*	*Year of planting and espacement.*	*Description of crop.*	*Quality class.*	*Past history.* Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	*Remarks.*
			Bleakhouse—cont.						
16 *Eucalyptus globulus.*	6·30	1920–21, 9 feet × 9 feet.	Aspect—South to south-west .. .. .. Slope—Steep to moderate. Soil—Red clay loam, fairly deep, moist with plenty of leaf mould. Crop—*Eucaluptus globulus* in good condition. Eupatorium mixed with a few shola shrubs is the undergrowth.	III	1919–20 1942–43	Clear-felling .. Do. ..	17 23	3,899 8,834	*See* remarks above.
			Springfield.						
1 *Eucalyptus globulus.*	5·30	1951, 11 feet × 11 feet ..	Aspect—North .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist. Crop—Mixed crop of *Eucalyptus punctata* and *Eucalyptus paniculata* in good condition with regrowth of *Acacia dealbata* and Eupatorium in two patches as undergrowth.	II	1926–27 1936–37 1950–51	Clear-felling .. Thinning .. Clear-felled ..	16 10 23	4,743 1,771 ..	This plantation originally (1927–28) of *Eucalyptus punctata* and paniculata was felled and converted into blue gum in 1951.
2 *Eucalyptus eugenioides.*	5·30	1928, 9 feet × 9 feet ..	Aspect—North .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist with a few boulders and rock. Crop—*Eucalyptus eugenioides* in good condition with a mixture of regrowth of Acacia dealbata and Eupatorium as undergrowth. Along stream shola shrubs are found.	II	1927–28	Clear - felling Thinning too heavy clearings by removal of Acacia were done in the year of planting.	17	2,084	To be felled and converted into blue gum in 1954–55.
3 *Do.*	5·80	Do. ..	Aspect—North-west .. .. .. Slope—Gentle. Soil—Shola type, red clay loam, deep and moist with scattered boulders. Crop—*Eucalyptus eugenioides* in good condition with a tendency to branch in some cases. Regrowth of *Acacia dealbata* all over, but in the east mixed with Eupatorium	II	1927–28	Clear felling ..	17	5,464	*See* remarks above.
4 *Eucalyptus globulus.*	5·80	1950, 11 feet × 11 feet ..	Aspect—North-west .. .. .. Slope—Moderate to gentle. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in good condition. *Eucalyptus pillularis* is the main undergrowth and competer with with it.	II	1928–29 1949–50	Clear-felling .. Do. ..	.. 19	4,122 ..	Originally planted with *Eucalyptus pillularis* (1930) and was felled in 1949 and converted into blue gum in 1950.

Do.	5·75	1950, 11 feet × 11 feet ..	Aspect—North .. .. Slope—Gentle. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in promising condition. *Eucalyptus pillularis* forms the main undergrowth.	II	1928–29 1949–50	Do. .. Do. ..	.. 19	2,317 ..	Do.
			Tent Hill.						
1 *Eucalyptus globulus.*	7·25	1944–45, 9 feet × 9 feet ..	Aspect—Level to north-east and east. Slope—Gentle to steep. Soil—Heavily yellow clay, poor quality. Crop—*Eucalyptus globulus* mixed with cupressous and casuarina.	III	1943–44	Clear-felling ..	54/55.	2,460	Originally planted with *Casuarina suberosa* in 1888–90 but as they did not grow well they were felled and regenerated with blue gum. Originally of two compartments now constituted into 1.
			Tiger Hill.						
1 *Eucalyptus globulus.*	11·35	1930–31, 9 feet × 9 feet ..	Aspect—South-west .. .. .. Slope—Gentle. Soil—Heavily black clay loam of shola type, poor quality. Crop—*Eucalyptus globulus* with thick undergrowth of Callitris.	III	1944–45	..	14/15.	2,675	Originally of two compartments now constituted into 1.
			Ghat Reserve.						
1 *Eucalyptus globulus.*	3·20	1942–43, 11 feet × 11 feet.	Aspect—South .. .. Slope—Steep. Soil—Black loam of poor quality. Crop—*Eucalyptus globulus* of poor quality.	..	..	..	..	..	It has not been worked previously.

Black Bridge Series.

Area—**The total area of the series is 172·37 acres.**

Black Bridge.

Forest settlement.—Lies in the Blackbridge reserve forest notified in G.O. No. 1321, Revenue (Forest No. 172), dated 1st February 1884, embodied in B.P. No. 4276 (Forest No. 446), dated 12th December 1884.

The road from Wellington to Kotagiri (Old Forest Road) is a right of way. Two plots of land measuring 2·80 acres and 0·55 acre are leased to the Wellington Gymkana club for the Golf-Course.

History.—Formed by the Jungle Conservancy Department in 1874–75. The whole area, after some irregular working in previous years, was clear-felled between 1911 and 1918 and now stands as simple coppice.

Teppakutchi.

Forest settlement.—Constituted Reserved Forest in G.O. No. 282, Revenue (Forest No. 52), dated 21st March 1892, embodied in Board's Proceedings Forest No. 201, dated 27th April 1892.,

The following right of way is admitted.

Public right of way over road entering the reserve on west side of S. No. 130, and leaving at eastern corner of S. No. 134.

History.—Formed by the Jungle Conservancy Department in 1870. Remained unworked till 1925. In that and the following year two acres each of about an acre was sold standing showing that a small profit can be derived from working the plantation. Now all the compartments are felled.

The areas of the compartments are so small and hence they have been reconstituted into 3 compartments only as in the times of Cox's plan, instead of 20 as was the case previously in Mr. Dyson's and Mr. C. R. Ranganathan's plan.

Compartment number and species.	Acreage.	Year of planting and espacement.	Description of crop.	Past history: Quality class.	Past history: Year of felling.	Past history: Method of felling.	Past history: Age at felling.	Past history: Outturn in stacked cubic feet per acre.	Remarks.
			Black Bridge.						
1 *Eucalyptus globulus coppice.*	8·20	1874–75. 6 feet × 6 feet ..	Aspect—South-south-west .. .. Slope—Moderate. Soil—Stiff red clayey loam of moderate depth; exposed in the south-west corner. Crop—*Eucalyptus globulus* Coppice—good in parts, poor in the south-west *Acacia dealbata* forms an undergrowth over major portion of the compartment. Eupatorium mixed with a few shola shrubs occurs in a small patch in the north and scattered evergreen scrub, viz., Dodonaea and Rhodomyrtus in the south and south east-west.	III	1897–01 1911–12 1929–30 1943–44	Not known .. Simple coppice. Do. Do.	23/27. 12 18 14	Not known. 4,000 4,800 3,840	
2 Do.	6·38	1874–75. 6 feet × 6 feet ..	Aspect—South and west .. .. .. Slope—Moderate. Soil—Stiff red clay of moderate depth. Crop—*Eucalyptus globulus.* Coppice of good growth except in the south-east corner where it is poor. Undergrowth is shola shrubs and Eupatorium except in the south-east where regrowth of *Acacia dealbata* and a small patch of evergreen scrub, viz., Dodonaea, Rhodomyrtus and ferns exist.	III	1897–01 1913–14 1931–32 1947–48	Not known .. Simple coppice. Do. Do.	23/27. 15 18 16	Not known. 5,855 4,270 4,871	

3	Do.	9·75	1874–75—6 feet × 6 feet.	Aspect—South .. .. Slope—Moderate. Soil—Stiff clayey loam of moderate depth. Crop—*Eucalyptus globulus* coppice in promising condition. Shola shrubs mixed with Eupatorium, scattered Dodonaea, ferns and shoots of *Acacia dealbata* form the main undergrowth shoots of *Acacia dealbata* are dense near the old forest road.	III	1897–01 1916–17 1933–34 1948–49	Not known .. Simple coppice. Do. Do.	23/27 17 17 15	.. 6,042 5,698 5,370	
4	Do.	9·85	Do.	Aspect—South and south-east .. .. Slope—Steep. Soil—Stiff clay, fairly deep with a few boulders and rocks. Crop—*Eucalyptus globulus* coppice, promising and in good condition; shola shrubs mixed with Eupatorium ferns, *Dodonaea viscosa* and shoots of *Acacia dealbata* form the undergrowth.	III	1897–01 1916–17 1934–35 1950–51	Not known .. Simple coppice. Do. Do.	23/27 17 18 16	Not known. 8,663 5,175 2,954	
5	Do.	5·45	Do.	Aspect—East .. .. Slope—Steep to very steep. Soil—Stiff clay; fairly deep with a few boulders and rock. Crop—*Eucalyptus globulus* coppice promising condition, but rather patches Sparse Eupatorium and a few shola shrubs form the undergrowth.	III	1897–01 1916–18 1935–36 1952–53	Not known .. Simple coppice. Do. Do.	23/27 17 18 17	.. 8,292 6,376 ..	
6 & 7	Do.	15·0	1942–43—9 feet × 9 feet.	Aspect—Level to south-west .. .. Slope—Steep to moderate. Soil—Reddish to black clayey loam of poor quality with hard soil. Crop—*Eucalyptus globulus* of poor quality with Rhodomyrtus and Eupatorium as undergrowth.	III	..	..	..	..	The whole area of 15·0 acres regenerated in 1942–43 has been constituted with 2 compartments, 6 of 5·0 acres and 7 of 10·0 acres. These were originally grass lands regenerated with blue gum in 1943.
8 to 12	Do.	50·0	1943–44—9 feet × 9 feet.	Aspect—Level to all aspects .. .. Slope—Steep to moderate. Soil—Reddish clay loam of poor quality. Crop—*Eucalyptus globulus* of poor quality with Rhodomyrtus undergrowth.	III	..	..	..	..	The whole area of 50 acres regenerated in 1943–44 has been constituted with five compartments of 10 acres each. These were originally grass lands near the village Illithorai and near the Hardwood plantation of 17·1 acres now constituted as compartment 17.
13	Do.	10·0	1944–45—9 feet × 9 feet.	Aspect—South to south-west .. .. Slope—Steep. Soil—Black clayey loam of poor quality. Crop—*Eucalyptus globulus* with Rhodomyrtus and Callitris as undergrowth.	III	..	..	..	..	This area was regenerated in 1944–45 and is of 10 acres. This was also originally grass land.

Compartment number and species.	Acreage.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Past history. Year of felling.	Past history. Method of felling.	Past history. Age at felling.	Past history. Outturn in stacked cubic feet per acre.	Remarks.
			Black Bridge—cont.						
14 *Eucalyptus globlus* coppice.	5·02	1945–46—9 feet × 9 feet.	Aspect—South to south-east .. .. Slope—Steep. Soil—Hard clayey loam of poor quality. Crop—*Eucalyptus globulus* of poor quality with Rhodomyrtus undergrowth.	III	..	..	..	..	This area of 5·02 acres was originally grass land and regenerated with bluegum in 1945–46.
15 *Do.*	3·00	1950—11 feet × 11 feet	Aspect—Level .. .. Slope—Gentle. Soil—Shola type of poor quality. Crop—*Eucalyptus globulus* of poor quality with grassy and shrubby undergrowth.	III	..	..	..	..	These plantation compartments 15 and 16 were raised by lessees after cultivating with potatoes. These plantations are poor contrary to expectations in a land rich in potato manure. The main reason was that there was a white grub which caused the cutting of collar portion of the seedings. There are near the golf links near Wellington and near compartment 3 of the series.
16 *Do.*	2·00	Do. ..	Aspect—Level .. .. Slope—Gentle. Soil—Shola type black clayey loam of poor quality. Crop—*Eucalyptus globulus* of poor quality with shrubby undergrowth.	III		..	..	..	Do.
17 *Do.*	17·10	1922–23—6 feet × 6 feet.	Aspect—West .. .. Slope—Moderate to steep. Soil—Red clay loam very poor, much subject to 'wash' and hard. Crop—*Eucalyptus globulus* Rhodomyrtus mixed with braken is the undergrowth.	III	..	.	..	..	Recently felled in 1952–53. and regenerated with bluegum.
			Teppakutchi.						
1 *Eucalyptus globulus*	15·05	1870 and 1926 to 1934, 9 feet × 9 feet.	Aspect—North-west .. .. .. Slope—Steep. Soil—Shola type, red clay loam, without crops of rock. Crop—*Eucalyptus globulus*, stocking poor, in poor condition, with Eupatorium and *Acacia dealbata* regrowth.	III	..		..	..	The present compartment is made up of compartments 1 to 9 of old working plan. The felling were indiscriminate in the past and yield was always unreliable also. The details of yield are as follows—

								1 1925–26 Coppice 55 16,260 2 1926–27 Do. 60/62 3 1930–32 Do. 60/62 4 1931–33 Do. 61/63 5 1932–33 Do. 62 6 1932–33 Do. 62 7 1932–33 Do. 62 8 1932–33 Do. 63 9 1933–34 Do. 63
Do.	10·20	1870 and 1930 to 1934—9 feet × 9 feet.	Aspect—North-west .. .. .. Slope—Steep. Soil—Shola type, blackish clayey loam without crops of rocks and boulders. Crop—*Eucalyptus globulus* stocking poor poor growth with Eupatorium and *Acacia dealbata* regrowth.	III	..	..	..	.. The present compartment is made up of compartments 10 to 16 of the old Working Plan. The general remarks above hold good. The yield figures are not available. 10— 1933–34 Coppice .. 63 11— 1933–34 Coppice .. 63 12— 1934 Coppice .. 64 13 to 16—1930–32 Coppice .. 60/62
Do.	5·37	1870 and 1935–36—9 feet × 9 feet.	Aspect—North-west .. .. .. Slope—Steep. Soil—Shola type black clayey loam with rocks and boulders.	III	..	..	..	.. Constituted with one compartment cut of the old compartments 17 to 20 of the lapsed plan. General remarks same as above old.
			Crop—*Eucalyptus globulus* coppice of poor growth with Eupatorium undergrowth (thick).	..	..	..	..	.. Compartment details. 17 to 20 1935–36 Simple coppice—65 yield figures are not available.

COONOOR PEAK.

Area.—The total area is 270·6 acres, made up of 228·74 acres of bluegum.

The total planted area is 229·0 acres.

Forest Settlement.—Notified as reserved forest in G.O. No. 1407, Revenue (Forest No. 182), dated 18th December 1884, embodied in B.P. No. 86 (Forest No. 16), dated 14th January 1885.

History.—Formed by the Jungle Conservancy department in 1872–73. The planting distance of 9 feet × 9 feet was adopted and in 1878, Colonel Beddome considered that planting at so wide an espacement had been a mistake, but by 1883 all signs of crookedness of growth had disappeared and Mr. Hutchin's measurements in that year showed that the growth per acre was equal, to, if not greater than, that of similarly aged plantations of 6 feet × 6 feet espacement.

The conifers and casuarinas were planted by Mr. Gamble between 1887 and 1891.

Prior to 1896 all felling appears to have been coppice with standards often leaving a great many standards per acre. From 1896 to 1901, there was no felling at all, and in 1902 simple coppice fellings were started. Between 1902 and 1912, the upper (more accessible) part of the plantation was felled over as simple coppice, the lower part being left unworked. Since then, roads have been made opening up the lower part of the plantation, and now practically the whole of the Eucalyptus area is simple coppice. Compartment 2 in block II, Tereiffe which contained calitris was converted to *Eucalyptus globulus* plantation during 1929–32. It was subdivided into 2*a*, 2*b* and 2*c* during the previous plan and is still continuing. There are many plantations with wattle in quincunx. Both the wattle and blue gum seem to have suffered and in the next rotation, only blue gum will be allowed to thrive by cutting back the interfering wattle growth.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Past history.					Remarks.
				Quality class.	Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	
			Coonoor Peak—Block I.						
1 *Eucalyptus globulus*	8·5	1872–73, 9 feet × 9 feet ..	Aspect—South-east .. .. .. Slope—Gentle to steep.	III	1895–96	Heavy thinning.	23	5,049	1908–09 felling included standard 36 years old.
			Soil—Shola type, red clayey loam, fairly moist and deep with small boulders in the south-east.	III	1908–09 1926–27	Clear felling .. Simple coppice.	13 18	10,150 9,232	
		1945–46, 11 feet × 11 feet.	Crop—*Eucalyptus globulus* coppice with artificial regeneration.	..	1944–45	Do.	18	6,437	In 1945–46, blanks were planted with blue gum seedlings. Re-planted in 1945–46.
2 *Do.*	7·42	1872–73, 9 feet × 9 feet.	Aspect—South and south-east .. Slope—Moderate to steep.	III	1889–90	Light thinning.	17	1,879	
			Soil—Shola type, red clayey loam of good depth, fairly moist, mixed with boulders in the south-east.	..	1911–12	Clear felling of 4·6 acres.	22	5,089	
			Crop—*Eucalyptus globulus* coppice ..	..	1952–53	Do.	..	..	
3 *Do.*	7·42	1872–73, 9 feet × 9 feet	Aspect—South-east and east .. .. Slope—Moderate to steep.	II	1888–89	Heavy thinning.	16	6,737	
			Soil—Shola type, red clayey loam, moist and deep, rich in humus.	..	1920–22	Clear felling including standards. 48 years old.	32	11,826	
					1938–39	..	18	5,072	In 1939–40 blanks were planted.
4 *Do.*	6·45	1872–73, 9 feet × 9 feet 1940–41, 9 feet × 9 feet.	Asepot—South .. .. .. Slope—Steep to gentle.	II	1893–94	Thinning.	21	Not known.	Standard 48 years old not included in clear felling.
			Soil—Shola type, clayey loam rich in humus, moist and deep.	..	1920–21 1939–40	Clear felling. Do.	27 18	26,224 7,770	Re-planted in 1940–41.
			Crop—*Eucalyptus globulus* coppice.						
5 *Do.*	5·75	1872–73, 9 feet × 9 feet	Aspect—East and south-east .. .. Slope—Steep to moderate.	II	1886–87	Light thinning	14	Not known.	
			Soil—Shola type, red clayey loam, fairly moist and deep with small boulders and rocks.	..	1917–18	Clear felling including standards 45 years old.	31	20,316	
			Crop—*Eucalyptus globulus*	..	1935–36 1951–52	Clear felling. .. Do.	18 16	8,256 6,354	
6 *Do.*	6·45	1872–73, 9 feet × 9 feet	Aspect—East .. .. Slope—Steep.	III	1891–92	Coppice with standards.	19	5,825	Leaving 50 standards per acre 1917–18 felling included standards 45 years old.
			Soil—Shola type, red clayey loam, fairly moist and deep mixed with large boulders.	..	1917–18	Clear felling ..	26	25,090	
			Crop—*Eucalyptus globulus*	..	1933–34 1950–51	Do.	16 17	6,549 5,760	Three blue gum standards of the following measurements were left unfelled during 1933–34.
7 *Do.*	2·50	1872–73, 9 feet × 9 feet ..	Aspect—East	II	1883	Simple coppice.	11	233 tons.	
			Slope—Steep.	..	1890	Simple coppice with standards.	7	5,444	
			Soil—Shola type, red clayey loam, fairly deep and moist with large boulders.	..	1918–19	Clear felling including standards 38 years old.	28	18,942	
			Crop—*Eucalyptus globulus*	—	1951–52	Clear felling.	16	8,024	

8	Do. ..	4·75	1872–73, 9 feet × 9 feet. 1939–40, 9 feet × 9 feet.	Aspect—East .. .. Slope—Moderate to gentle. Soil—Shola type, red clayey loam, moist and deep. Crop—*Eucalyptus globulus*.	III	1902–03	Simple coppice leaving a few standards on the eastern boundary.	30	8,544	1939–40 replanted.
						1919–20	Clear felling ..	17	8,358	
						1938–39	Do. ..	19	6,195	
9	Do. ..	6·50	1872–73, 9 feet × 9 feet ..	Aspect—East, south-east and north-east. Slope—Steep. Soil—Shola type, red clayey loam mixed with boulders. Crop—*Eucalyptus globulus*.	III	1889–90	Coppice with standards.	16	6,200	
						1918–19	Clear felling with standards 46 years old.	30	16,276	
						1936–37	Clear felling ..	18	7,056	
						1951–52	Do. ..	15	3,720	
10	Do. ..	6·0	1872–73, 9 feet × 9 feet ..	Aspect—South-east .. .. .. Slope—Moderate to steep. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalptus globulus*.	I	1892–93	Coppice with standards leaving 64 standards per acre.	20	6,610	A patch of about an acre appears to have been burnt by fire in 1935.
						1919–20	Clear felling including standards 47 years old.	27	16,024	
						1952–53	Do.	23	..	
11	Do. ..	6·4	1872–73, 9 feet × 9 feet ..	Aspect—South-east .. .. .. Slope—Steep. Soil—Shola type, red clayey loam, deep and moist with large boulders. Crop—*Eucalyptus globulus*.	III	1891–92	Coppice with standards.	19	5,328	
						1918–19	Clear felling including standards 46 years old.	27	24,185	
									..	
						1936–37	Clear felling ..	18	10,167	
						1951–52	Do. ..	15	4,032	
12	Do. ..	6·3	1872–73, 9 feet × 9 feet .. 1940–41, 9 feet × 9 feet ..	Aspect—South-east .. .. .. Slope—Steep. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus*.	III	1889–90	Coppice with standard.	17	6,300	The yield record is obviously wrong.
						1922–23	Clear felling including standards.	33	7,610	Replanted in 1940–41.
						1939–40	Do.	17	4,685	
13	Do. ..	1·95	1872–73, 9 feet × 9 feet ..	Aspect—East .. .. Slope—Steep to moderate. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus*.	III	1888–89	Coppice with standards.	16	4,924	Planted in blanks during 1941.
						1909–10	Clear felling including standards.	19	11,502	
						1923–24	Clear felling ..	14	11,192	Figures of doubtful value.
						1940–41	Do. ..	17	7,800	
14	Do. ..	4·0	1872–73, 9 feet ×9 feet.	Aspect—East to south-east .. .. Slope—Moderate to steep. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus*.	II	1887–88	Coppice with standards.	15	..	Blanks planted in 1942.
						1907–08	Clear felling including standards.	20	14,869	
						1923–24	Simple coppice.	16	8,534	
						1941–42	Do.	18	6,236	
15	Do. ..	3·7	1872–73, 9 feet × 9 feet .. 1941–42, 9 feet × 9 feet ..	Aspect—South-east to east .. .. Slope—Moderate to gentle. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus.* Coppice with shola shrubs as undergrowth.	II	1886–87	..	14	..	
						1896–97	Coppice with standards.	10	9,828	Replanted in 1941–42.
						1921–22	Clear felling	25	22,177	
						1940–41	Do.	19	6,400	

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Coonoor Peak—Block I—cont.						
16 *Eucalyptus globulus.*	3·98	1872–73, 9 feet × 9 feet ..	Aspect—South-east .. .. .. Slope—Moderate to gentle. Soil—Shola type, red clayey loam deep and moist. Crop—Eucalyptus coppice with shola shrubs with a little Eupatorium form the undergrowth.	II	1886–87	Coppice with standards.	14	..	Blanks planted in 1941.
					1902–03	Do.	15	7,679	
					1921–22	Clear felling including standards.	19	9,117	
					1940–41	Do.	19	8,052	
17 *Do.*	1·06	1872–73, 9 feet × 9 feet ..	Aspect—North-east .. .. .. Slope—Gentle. Soil—Shola type, red clayey loam deep and moist. Crop—Eucalyptus coppice with shola shrubs as undergrowth	II	1886–87	Coppice with standards.	14	..	Blanks planted in 1941.
					1921–22	Clear felling including standards.	35	12,741	
					1940–41	Do.	19	3,334	
18 *Do.*	5·57	1872–73, 9 feet × 9 feet ..	Aspect—East to north-east .. .. Slope—Gentle to steep. Soil—Shola type, red clayey loam deep and moist.	II	1892–93	Coppice with standards.	20	..	Blanks planted in 1942.
					1922–23	Clear felling including standards.	30	18,731	
					1941–42	Do.	10	5,941	
19 *Do.*	2·00	1872–73, 9 feet × 9 feet ..	Aspect—North-east to east .. .. Slope—Moderate to steep. Soil—Shola type, red clayey loam, deep and moist mixed with large boulders. Crop—*Eucalyptus globulus.*	III	1890–91	Coppice with standards.	18	..	
					1912–13	Coppice including standards.	22	16,118	Blanks planted in 1945.
					1924–25	Simple coppice.	12	6,177	
					1944–45	Do.	20	6,795	
20 *Do.*	4·25	1872–73, 9 feet × 9 feet ..	Aspect—East .. .. .. Slope—Gentle to steep. Soil—Shola type, red clayey loam with a few outcrops of rock. Crop—*Eucalyptus globulus.*	II	1887–88	..	15	..	
					1900–01	Coppice with standards.	12	..	
					1913–14	Clear felling including standards.	13	10,513	
					1932–33	Simple coppice.	19	6,949	
					1949–50	Do.	17	4,254	
21 *Do.*	3·75	1872–73, 9 feet × 9 feet.	Aspect—East to south-east .. .. Slope—Steep. Soil—Shola type, red clayey loam, fairly deep and moist with scattered out crops of rock. Crop—*Eucalyptus globulus.*	III	1895–96	Coppice with standards.	22	10,761	
					1913–14	Clear felling including standards.	18	28,695	There is doubt about the accuracy of the yield from the 1913–14 felling.
					1931–32	Simple coppice.	18	13,143	1950–51 blanks planted.
					1949–50	Do.	18	3,082	
22 *Do.*	7·50	1872–73, 9 feet × 9 feet ..	Aspect—East, north-east and south-east. Slope—Gentle. Soil—Shola type, red clayey loam. Crop—*Eucalyptus globulus* coppice in good condition with shola shrub as undergrowth.	III	1887–88	Coppice with standards.	15	..	
					1908–09	Clear felling ..	21	15,755	
					1924–25	Do. ..	16	9,118	
					1942–43.	Do. ..	18	8,544	Blanks only planted in 1943.

23	*Do.*	5·10	1872–73, 9 feet × 9 feet.	Aspect—East and south-east .. .. Slope—Gentle to moderate. Soil—Shola type, red clayey loam, with large boulders. Crop—*Eucalyptus globulus* coppice in fairly good condition with shola shrubs under growth except along the middle road and grass road where dense regrowth of *Acacia dealbata* occurs.	II	1888–89	Coppice with standards.	15		
						1905–06	Clear felling including standards.	17	10,600	
						1924–25	Clear felling ..	19	6,540	1945–46 blanks re-planted.
						1944–45	Do.	20	6,000	
									TONS.	
24	*Do.*	3·35	1872–73, 9 feet × 9 feet ..	Aspect—South and south-east .. .. Slope—Gentle. Soil—Shola type, red clayey loam, very deep and moist. Crop—*Eucalyptus globulus*.	III	1883	Single coppice.	11	233	
						1902–03	Do.	19	12,300	
						1923–24	Do.	21	7608	Blanks only planted in 1943.
						1942–43			C.FT.	
							Do.	19	4,832	
25	*Do.*	5·75	1872–73, 9 feet × 9 feet ..	Aspect—South-east .. .. .. Slope—Moderate to steep. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus* coppice in fairly good condition, Shola shrubs mixed with Eupatorium form the undergrowth.	II	1894–95	Coppice with standards.	22	9,446	
						1913–15	Clear feeling including standards.	30	22,618	
						1932–33	Simple coppice.	19	9,290	
						1949–50	Do.	17	5,430	
26	*Do.*	3·75	1872–73, 9 feet × 9 feet ..	Aspect—East and south-east .. .. Slope—Very steep. Soil—Shola type, red clayey loam, deep and moist with a few out crops of rock. Crop—*Eucalyptus globulus* Shola shrubs in the middle mixed with Eupatorium, ferns, etc.	III	1889–90	Coppice with standard.	17	9,500	
						1913–14	Clear felling including standards.	24	14,742	
						1932–33	Simple coppice.	19	7,032	
						1949–50	Do.	17	5,184	
27	*Do.*	4·75	1872–73, 9 feet × 9 feet .. 1944–45.	Aspect—East .. .. .. Slope—Steep. Soil—Shola type, red clayey loam, fairly deep and moist with outcrops of large laterite rock. Crop—*Eucalyptus globulus* coppice in fairly good condition. Shola shrubs mixed with thin Eupatorium.	III	1886–87	Coppice with standards.	14	..	
						1906–07	Clear felling including standards.	19	12,212	
						1924–25	Clear felling ..	18	16,630	Planted in 1944–45.
						1943–44	Do. ..	18/20	7,636	
28	*Do.*	4·37	1872–73, 9 feet × 9 feet .. 1946–47.	Aspect—North-west .. .. .. Slope—Steep. Soil—Red clayey loam with a few outcrops of rock. Crop—*Eucalyptus globulus* coppice in fairly good condition with shola shrubs mixed with brackens and ferns undergrowth.	II	1895–96	Coppice with standards.	23	7,528	Planted in 1946–47.
						1912–13	Clear felling including standards.	17	11,795	
						1929–30	Simple coppice.	17	7,160	
						1945–46	Do.	16	6,714	
								..		
29	*Do.*	6·62	1872–73, 9 feet × 9 feet 1945–46, 9 feet × 9 feet.	Aspect—East and south-east .. .. Slope—Gentle to moderate. Soil—Red clayey loam with large boulders. Crop—*Eucalyptus globulus* coppice in good condition with shola shrubs and some Eupatorium as undergrowth.	II	1889–90	Coppice with standards.	17	7,155	
						1905–06	Clear felling except for a belt of standard.	16	9,781	
						1926–27	Clear fellings including standards.	21	13,896	
						1944–45	Do.	18	11,220	Replanted in 1945–46.

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Quality class.	Past history. Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Coonoor Peak—Block I—cont.						
30 *Eucalyptus globulus*.	2·75	1872–73, 9 feet × 9 feet ..	Aspect—South-east .. .. Slope—Level almost. Soil—Shola type, red clayey loam very deep with laterite boulders. Crop—*Eucalyptus globulus* coppice, rather poorly stocked. Shola shrubs mixed with some Eupatorium form the undergrowth.	II	1894–95 1912–13 1928–29 1944–45	Coppice with standards. Clear felling including standards. Simple coppice. Do.	22 18 16 16	8,875 17,359 9,670 5,268	Blanks planted in 1945–46.
31	5·20	1872–73, 9 feet × 9 feet .. 1946–47, 9 feet × 9 feet.	Aspect—South and south-west .. .. Slope—Gentle to moderate. Soil—Shola type, red clayey loam with small boulders. Crop—*Eucalyptus globulus* coppice with undergrowth of shola shrubs and some Dodonaea.	II	1887–88 1906–07 1927–28 1945–46	Clear fellling probably including standards. Clear felling .. Simple coppice. Do.	15 19 21 18	.. 9,879 9,500 6,042	Replanted in 1946–47
32 Do.	5·60	1872–73, 9 feet × 9 feet .. 1946–47, 9 feet × 9 feet.	Aspect—South and south-east .. .. Slope—Gentle to moderate Soil—Shola type, red clayey loam with small boulders. Crop—*Eucalyptus globulus* coppice with undergrowth of shola shrubs.	II	1893–94 1912–13 1928–29 1945–46	Coppice with standards. Clear felling including standards. Simple coppice. Do.	21 10 16 17	9,300 11,886 7,256 6,204	Replanted in 1946–47.
33 Do.	3·35	1872–73, 9 feet × 9 feet .. 1947–48, 1948–49, 9 feet ×9 feet.	Aspect—South-east to north-east .. Slope—Gentle to moderate. Soil—Shola type, red clayey loam fairly deep. Crop—*Eucalyptus globulus* with undergrowth of shola shrubs mixed with Eupatorium.	II	1890–91 1911–12 1928–29 1946–47	Coppice with standards. Clear felling including standards. Simple coppice Do.	18 21 17 18	6,300 14,569 7,056 4,692	Replanted in 1948–49 Wattle in quin-cunx.
34 Do.	7·38	1872–73, 9 feet × 9 feet.	Aspect—South-east .. .. Slope—Gentle. Soil—Shola type, red clayey loam. Crop—*Eucalyptus globulus* in fairly good condition. Shola shrubs are the undergrowth mixed with dense Eupatorium.	II	1886–87 1903–04 1927–28 1946–47	Copice with standards. Clear felling including standards. Simple copice. Do.	14 17 24 19	.. 10,050 7,320 5,712	
35 Do.	6·95	1872–73, 9 feet × 9 feet ..	Aspect—North-east .. .. Slope—Gentle to moderate. Soil—Shola type, red clayey loam, deep and moist with outcrops of rock. Crop—*Eucalyptus globulus* coppice with shola shrubs mixed with regrowth of *Acacia dealbata* and Eupatorium.	III	1893–94 1912–15 1930–31 1946–47	Coppice with standard. Clear felling. Simple coppice. Do.	21 21 17 16	8,110 13,660 7,648 8,130	
36 Do.	6·00	1872–73, 9 feet × 9 feet ..	Aspect—North-west .. .. Slope—Moderate. Soil—Shola type, red clayey loam. Crop—*Eucalyptus globulus* undergrowth of shola shrubs mixed with shoots of *Acacia dealbata* and growth of Rhododendron where dense calliris, cupressus and shola shrubs occur.	II	1886–87 1907–08 1915–18 1930–31 1948–49	Coppice with standards. Light thinning of very uneven age. Clear-felling .. Simple coppice. Do.	14 21 8 15 18	(Not known.) 2,959 18,071 7,647 7,560	1949–50 blanks planted.

37	*Do.*	7·60	1872–73, 9 feet × 9 feet ..	Aspect—South and south-east .. .. Slope—Steep to very steep. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus* with undergrowth of shola shrubs mixed with Eupatorium.	III	1888–89	Coppice with standards.	16	6,688	
						1909–10	Clear-felling ..	21	11,680	
						1924–25	Do. ..	15	7,200	
						1943–44	Do. ..	19	7,000	Planted the blanks in 1944–45.
38	*Do.*	4·75	Do.	Aspect—South-east .. .. .. Slope—Moderate. Soil—Shola type, red clayey loam, deep and moist with a few rocks. Crop—*Eucalyptus globulus* coppice poorly stocked with shola shrubs and regrowth of *Acacia dealbata*. *Acacia dealbata* regrowth covers up the blanks.	II	1892–93	Coppice with standards.	20	3,116	
						1916–18	Clear-felling ..	25	13,017	
						1931–32	Simple coppice.	15	6,878	
						1950–51	Do.	19	5,400	
39	*Do.*	6·50	1872–73, 9 feet × 9 feet 1945–46, 9 feet × 9 feet.	Aspect—South-east .. .. .. Slope—Steep to very steep. Soil—Shola type, red clayey loam, deep and moist. Crop—*Eucalyptus globulus* coppice in good condition with undergrowth of shola shrubs mixed with a little Eupatorium.	II	1886–87	Coppice with standards.	14	..	
						1909–10	Two acres clear-felled yielding 3,050 cubic feet per acre.	..	..	Replanted in 1945–46.
						1925–27	Clear-felled ..	Age uneven.	18,010	
						1944–45	Do. ..	17/19	7,640	
40	*Do.*	5·3	1872–73, 9 feet × 9 feet.	Aspect—South-east .. .. .. Slope—Steep to very steep. Soil—Red clayey loam with large boulders. Crop—*Eucalyptus globulus* with shola shrubs mixed with Eupatorium.	II	1886–87	Coppice with standards.	14	Not known.	
						1910–11	Clear-felling ..	24	14,838	
						1925–26	Do. ..	15	7,392	
						1943–44	Do. ..	18	6,936	Blanks planted in 1944–45.
				Coonoor Peak—Block II (Teneriffe).						
1	**Shola**	33·5	1887–91	Aspect—Various—Southern, south-western, north-western and northern. Slope—Mostly very steep. Soil—Red clayey loam in some places, clayey loam mixed with large laterite boulders, and elsewhere very rocky. Crop—The shola is mostly scrub. Better growth is in the north-west corner adjoining Woodhouselee road. The chief species are *Engenia* spp., *Vaccinum*, *Turpinia pomifers*, *Rhododendron*, *Eurya japonica*, etc. In higher altitude adjoining the rocky portion are found stunted *Rhododendron*, *Rhodomyrtus*, *Dodonaea viscosa*, bracken and bramble, mixed with scattered shola shrubs. In the lower slopes shola is mixed with scattered *Acacia dealbata* and Callitris.	..	..	..	..	..	A few Pinus and Callitris trees are found on the top.
	Rock	3·0								
	***Casuarina suberosa* and *Grevillea robusta*.**	11·7		The growth in the higher places is more open.	..	..	..	..	..	Have not been worked.
	Callitris and Cypress.	15·2		*Casuarina suberosa*—Poorly stocked and very stunted in growth. The crop is mixed with shola species, scattered *Acacia dealbata*, Callitris and Pinus. Plantation is complete failure. Callitris and Cypress—Badly grown and damaged by wind. **Natural regeneration of Callitris is profuse.**						
		63·4								

Compartment number and species.	Area in acres.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Coonoor Peak—Block II (Teneriffe)—cont.						
2A. *Eucalyptus globulus* ..	3·65	1929–30, 9 feet × 9 feet ..	Aspect—South .. .. Slope—Moderate. Soil—Red clayey loam with laterite boulders. Crop—Vigorous *Eucalyptus globulus*, better stocked and better grown. Undergrowth of shola shrubs. Eupatorium and Dodonaea and scattered with regrowth of Callitris all over.	I	1928–29 1949–50 and 1950–51	Clear-felling .. Do. ..	39 21	5,550 1,024	Planted in 1887–91 with Callitris and pine (*Pinus langifolia* and maritima) and a few insignis. In 1928 it was found very badly grown and suppressed by the Callitris. Hence replanted with blue gum.
2B. Do.	4·25	1930–31, 9 feet × 9 feet ..	Aspect—South .. .. Slope—Moderate. Soil—Red clayey loam with laterite boulders. Crop—Vigorous Eucalyptus Eupatorium mixed with Dodonaea. Growth of Callitris is found in patches all over.	I	1929–30 1949–50 and 1950–51.	Clear-felling .. Clear-felling ..	40 19/20	5,475 7,575	
2C. Do.	3·65	1931–32, 9 feet × 9 feet ..	Aspect—South .. .. Slope—Moderate to steep. Soil—Red clayey loam mixed with laterite boulders. Crop—Vigorous *Eucalyptus globulus*, better grown towards the south. Undergrowth of Eupatorium mixed with Dodonaea in the south with pure Dodonaea in the north, and free of undergrowth in the north-west corner. Regrowth of Callitris is found scattered all over.	I	1930–31 1949–50 and 1950–51.	.. Clear-felling ..	41 19/20	5,203 7,785	Planted in 1887–91 with Callitris and pine (*Pinus langifolia* and maritima) and a few insignis. In 1928 it was found very badly grown and suppressed by the Callitris. The whole plantation is planted with blue gum now.

RALLIA AND LITTLE RALLIA.

Area.—The total planted area in Rallia, Little Rallia, Naduhatti, Longwood and Sullicode is 150·01 acres.

Little Rallia was notified in G.O. No. 349, Revenue (Forest No. 107), dated 20th April 1891, embodied in B.P. No. 315, dated 18th July 1891.

Rallia was notified in G.O. No. 170, Revenue (Forest No. 28), dated 23rd February 1892, embodied in B.P. No. 110, dated 14th March 1892.

Rallia addition was notified in G.O. No. 1184, Revenue (Forest No. 289), dated 28th November 1892, embodied in B.P. No. 720, dated 17th December 1892 (acquired for erection of a charcoal kiln).

The following rights are admitted in these reserves :—

(1) Little Rallia—Right of way over bridlepath from Batatti to Honnathalai.
(2) Right of way over a footpath from Bettumund to Hosahathi.
(3) Rallia—Field No. 510 is an enclosure with right of access for men and cattle over a path leading to it.
(4) A footpath from Bandumi.
(5) Right of way from Bandumi to Berhatti.

History.—Little Rallia was formed in 1870–71 by the Jungle Conservancy Department.

Little Rallia remained unworked till 1927–28 when the present compartment 1 was clear-felled for charcoal manufacture. Compartments 2 and 3 were clear-felled in 1928–29 and 1929–30.

Rallia was planted in 1872, espacement 9′ × 9′. Eucalyptus and Acacia were planted in alternate broad strips. From 1888 the plantation was worked as coppice with standards for a few years, but the records are scanty. From 1905 onwards till about 1911 about 7·25 acres (in compartments 1 and 2) were clear-felled for charcoal manufacture.

The plantation remained unworked till 1930–31 when clear felling was resumed. Compartments 3 to 7 have been clear-felled now. Compartments 13 to 16 which were under Callitris were planted with *Eucalyptus globulus* after clear-felling in 1931–32.

These plantations have been worked with more regularity from 1943 onwards and these are now coppice crops.

Compartment number and species.	Acreage.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
			Little Rallia.						
1 *Eucalyptus globulus.*	5·25	1877, 6 feet × 6 feet	Aspect—North-east Slope—Flat in the south and moderately steep in other places. Soil—Grass land type, red clayey loam, rather gravelly poor and dry. Crop—*Eucalyptus globulus* coppice in fairly good condition with evergreen scrub, viz., Rhodomyrtus, Dodonaea and ferns, mixed with a few shola shrubs as undergrowth.	II	1927–28 1948–49	Simple coppice. Do.	50 21	17,160 4,032	So far as is known, has never been worked prior to 1927–28. The crop felled in 1927–28 was of poor quality though densely stocked.
2 Do.	2·75	Do.	Aspect—North-east Slope—Flat in the south and moderately steep elsewhere Soil—Grass land type, red clayey loam, rather gravelly poor and dry. Crop—*Eucalyptus globulus* coppice in fairly good condition with evergreen scrub, viz., Rhodomyrtus, Dodonaea and ferns, mixed with a few shola shrubs and Eupatorium as undergrowth.	II	1928–29 1948–49	Simple coppice. Do.	51 20	11,867 4,070	....
3 Do.	2·50	Do.	Aspect—North-east Slope—Moderately steep. Soil—Grass land type, red clayey loam, rather gravelly, poor and dry with a few boulders. Crop—*Eucalyptus globulus* coppice in fairly good condition with the undergrowth of evergreen scrub, viz., Rhodomyrtus, Dodonaea and ferns and a few shola shrubs and Eupatorium.	I	1929–30 1949–50 and 1950–51.	Do. Do.	52 20/21	14,978 7,575	....
			Rallia.						
1 *Eucalyptus globulus.*	2·50	1870–71, 9 feet × 9 feet	Aspect—North, north-western Slope—Gentle. Soil—Shola type, clayey loam, rich in black humus, deep and moist. Crop—Pure *Eucalyptus globulus* coppice in good condition with scattered shola shurbs as undergrowth and *Acacia melanoxylon* as undergrowth. Fairly dense. Eupatorium is found in the north-west.	II	1947–48	..	77	9,980	The greater portion of the compartment was clear-felled between 1905 and 1912 for the manufacture of charcoal. There are a few trees of *Eucalyptus eugenioides* in the north-west corner.
2A Do.	7·25	1872, 9 feet × 9 feet	Aspect—North, north-western Slope—Steep near the ridge and the moderate near the road. Soil—Red clayey loam, rich with black humus, deep and moist. Crop—*Eucalyptus globulus* coppice in fairly good condition.	III	1944–45	..	72	7,780	A small portion of the compartment was clear-felled between 1905 and 1912, for the manufacture of charcoal.
2B		....	Do.	III	1943–44	..	..	8,648	....

Compartment number and species.	Acreage.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Past history. Year of felling.	Past history. Method of felling.	Past history. Age at felling.	Past history. Outturn in stacked cubic feet per acre.	Remarks.
			Rallia—cont.						
3 **Eucalyptus globulus.**	3·50	1872, 9 feet × 9 feet ..	Aspect—North .. .. Slope—Gentle. Soil—Shola type, black clayey loam, rich in humus, very moist and deep. Crop—*Eucalyptus globulus* coppice in fairly good condition. Eupatorium with scattered shola shrubs and *Acacia dealbata* is the undergrowth.	I	1930–31	Simple coppice.	58	17,400	A few shoots of *Eucalyptus obliqua* are found in the north-east corner. These three compartments (with compartments 12 below) formed compartment 3 of Mr. Cox's Working Plan. All were planted in 1872 and had not been worked since except for a thinning between 1887 and 1897. Till 1930–31, when felling started in compartment 3 and extended progressively to compartments 4, 5, 6 and 7.
4 **Do.**	2·88	Do. ..	Aspect—North .. .. Slope—Gentle. Soil—Shola type, black clayey loam very moist and deep. .. Crop—*Eucalyptus globulus* coppice in fairly good condition, growth promising, with shola shrubs mixed with Eupatorium and brambles as undergrowth.	II	1931–32	Do.	59	17,113	*See* remarks above.
					1949–50 and 1950–51.	..	18	6,390	
5 **Do.**	2·8	Do. ..	Aspect—North .. .. Slope—Gentle. .. .. Soil—Shola type, black clayey loam, rich in humus, very deep and moist. Crop—*Eucalyptus globulus* coppice, fairly vigorous, scattered Eupatorium, shola shrubs and brambles as undergrowth except in the north-east corner where *Acacia dealbata* occurs.	II	1933–34 and 1952–53.	Simple coppice.	60	Sold to contractor for a period of three years with compartments 6, 7 and 14.	*See* remarks above.
6 **Do.**	2·9	Do. ..	Aspect—North and north-west .. .. Slope—Rather steep. Soil—Shola type, black clayey loam, deep and moist. Crop—*Eucalyptus globulus* coppice growth, uneven, fairly vigorous with scattered shola shrubs and *Acacia dealbata* as undergrowth. A few stumps of *Eucalyptus eugenioides* are found.	II	1933–36	Do.	61/65	16,552	The actual felling was started by the department in 1934. It was taken up by contractor in 1935 May and completed by him by 1936 April. The area south of the road is that felled by the contractor. Compartments 6 to 10 form compartment 4 of Mr. Cox's Working Plan. They had not been worked except for thinnings or perhaps coppice with standards.

7	*Do.*	3·6	1872, 9 feet × 9 feet ..	Aspect—North and north-west .. .. Slope—Pretty steep. Soil—Shola type, red clay loam, deep and moist. Crop—Felling just completed. There is promise of a fairly good crop of coppice. A few stumps of *Eucalyptus eugenioides* occur.	III	1936–37	Do.	64	16,812	
8	*Do.*	3·1	1872, 9 feet × 9 feet ..	Aspect—North and north-west .. .. Slope—Steep. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* coppice in good condition with sparce undergrowth of shola shrubs.	II	1937–38 1944–45	.. ..	.. 72	.. 25,480	*See* remarks above.
9	*Do.*	3·0	1872, 9 feet × 9 feet ..	Aspect—North and north-west .. .. Slope—Steep. Soil—Shola type, red clay loam deep and moist. Crop—*Eucalyptus globulus* coppice, fairly good in condition with undergrowth of shola shrubs except in the south-east corner where evergreen shrub occurs.	III	.. 1948–49	.. ..	.. 76	9,040	
10	*Do.*	3·0	1872, 9 feet × 9 feet ..	Aspect—North-west .. .. .. Slope—Moderate. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* in fairly good condition with shola shrubs as undergrowth except in the south-west corner where everygreen shrub occur.	III	1950–51	..	78	11,025	
11	*Do.*	6·5 0·3 6·8	1872, 9 feet × 9 feet ..	Aspect—North-west .. .. .. Slope—Pretty steep. Soil—Shola type, red clay loam, deep and moist. Crop—*Eucalyptus globulus* coppice fairly promising in growth and condition. Crop uneven as the area below the road was felled in 1934. Coppice in the rest of the area felled in 1935 is just appearing Eupatorium with shola shrubs as the undergrowth.	I	1934–35	Simple coppice.	62/63	8,066	Felling of the area in part below the road was done in 1935. No reliable record of fellings before 1934–35, but had probably been thinned.
12	*Acacia melanoxylon* and *Eucalyptus globulus* high forest swamp.	1·6 0·2 7·8 9·6	About 1872	Aspect—Level .. .. .. Slope—Level. Soil—Shola type, clay loam, deep and moist. Crop—*Eucalyptus globulus* high forest and *Acacia melanoxylon* the latter of fine growth with shola shrubs as under growth.	..	..	..	..	..	Formed part of compartment 3 of Mr. Cox's Working plan.

Rallia—cont.

Compartment number and species.	Acreage.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
13A *Eucalyptus globulus.*	7·0	1932, 9 feet × 9 feet	Aspect—South .. .. Slope—Moderate to steep. Soil—Grass land type, red clay loam, rather gravelly with out-crop of sheet rock and boulders. Crop—*Eucalyptus globulus.*	III	1931–32	Clear felling of old compartment 13. Clear felling of compartment 14 part (4 acres).	39 42	6,187	Includes the yield of 4 acres of compartment 14 and 9·50 acres of compartment 13. The total yield over 13·5 acres was 85,320 c.ft. Thus the average per acre is 6,187 C. FT.
					1950–51	..	77	5,709	Originally Callitris and *Pinus longifolia* planted 6 feet × 6 feet in 1892. The part of leox's compartment-7 included was planted with Callitris only in 1892. Outside the compartment in the south a few Callitris trees of previous rotation are found. Formed compartment 6 and part of compartment 7 of Mr. Cox's working plan. Formed compartment 13 and part of compartment 14 of Mr. Dyson's working plan, now divided into 13A and 13B.
13B Do.	7·90	1932, 9 feet × 9 feet	Do.	II	..	..	—	..	
14A Do.	3·70	1933, 9 feet × 9 feet	Aspect—South-west .. .. .. Slope—Steep. Soil—Grass-land, red clay loam rather gravelly and poor with stones and boulders of granite and laterite.	II	1932–33	Clear felling ..	43	4,436	This average yield is derived from the total yield of 15·15 acres (the balance of Mr. Dyson's compartment 14) felled in 1932–33 which was 67,200 c.ft. Planted in 1892, 6 feet × 6 feet with Callitris. Present compartment 14 forms part of Mr. Dyson's compartment 14. Now divided into 14A and 14B part of former compartment 7 of Mr. Cox's working plan.
14B Do.	8·60	1933, 9 feet × 9 feet	Do.	II	1952–53	..	—	..	Do.
15A Do.	9·00	1934, 9 feet × 9 feet	Aspect—North-west, south-east and west. Slope—Moderate to gentle. Soil—Red clay loam rather gravelly mixed with small stones and laterite boulders. Out-crop of sheet rock. Rather poor.	II	1934–35	Do.	44	4,359	This compartment is formed of Mr. Dyson's compartment, 15 and 16. The area felled is as follows :— ACS. Compartment 15.. 11·5; Compartment 16.. 6·2; Total .. 17·7

								The total yield of 17·7 acres is 77,150 c.ft. Planted in 1889–90, 6 feet × 6 feet with Callitris and *pinus longifolia*.
15B	*Do.*	9·20	1934, 9 feet × 9 feet	Do.				Do.
				Naduhatti.				
1	*Eucalyptus globulus.*	About 10	9 feet × 9 feet	Aspect—South Soil—Red clay with boulders, poor. Slope—Moderately steep. Crop—*Eucalyptus globulus* coppice, not well grown, poorly stocked with many blanks. Undergrowth of evergreen scrub composed of Rhodomyrtus, Dodonaea, Hypericum, Berberis and ferns.		1930 1945	Clearfelling	318 blue gum trees were sold standing in 1929–30 for Rs. 1,315.
				Longwood.				
1	*Eucalyptus globulus.*	5·60	1949, 11 feet × 11 feet	Aspect—South. Soil—Black loam. Slope—Moderate. Crop—*Eucalyptus globulus* with Eupatorium.	III			Planted in 1949 near the Longwood rest-house to break the monotony.
				Sullicode.				
1	*Eucalyptus globulus.*	14·00	1950, 11 feet × 11 feet	Aspect—Eastern Soil—Poor black clayey loam. Slope—Steep. Crop—*Eucalyptus globulus* with thick wattle undergrowth.	III			The original crop of wattle was cut and removed in 1949. The area was re-generated with blue gum.
2	*Do.*	5·50	1951, 11 feet × 11 feet	Aspect—Western Soil—Poor swampy loam. Slope—Steep to moderate. Crop—*Eucalyptus globulus* with thick wattle undergrowth.	III			The original crop of wattle was cut and removed in 1951. The area was re-generated with blue gum.
3	*Do.*	6·00	1951, 11 feet × 11 feet	Aspect—Southern Soil—Black loam. Slope—Moderate. Crop—*Eucalyptus globulus* with thick wattle undergrowth.	III			

SIMS PARK.

Area.—The total area is 100·6 acres of which 10·6 acres are planted with Miscellaneous species of Eucalyptus and other exotics.

2·2 acres nominally grass and 26·5 acres include the public part of Sim's Park and of the 60·8 acres of Shola part in compartment-1, has been handed over to the Curator, Government Gardens, for use as an experimental orchard and

0·5 acres Ranger's quarters.

Forest Settlement.—Sim's Park Reserved Forest No. I (Compartments 2 to 5) was notified in G.O. No. 1407, Revenue (Forest No. 182), dated 18th December 1884, embodied in B.P. No. 76, Forest, dated 14th January 1885.

The carriage drive through the park is a right of way. A right is admitted to the use of the high level water channel which supplies part of Coonoor with water.

Sim's Park No. II (Compartment I) was notified in G.O. No. 1321, Revenue (Forest No. 172), dated 21st January 1884, embodied in B.P. No. 4276 (Forest No. 446), dated 12th December 1884.

History.—The lower reserve (Sim's Park No. 1) was partly converted into a public garden before reservation Compartments 2 and 3, though nominally Reserved forest, are under the control of the Curator, Government Gardens.

Compartment 1 (Sim's Park No. II) was reserved by Mr. Gamble as an experimental silvicultural garden and was planted between 1887 and 1891 with a large variety of exotics. It was intended that the area should form a model for plantation work on a large scale, and should serve as a training ground for young forest officers. With changes in the administration this object was neglected, and the experimental plantations seem to have come gradually under the control of the Curator. But in 1906 the whole of compartment I was resumed by the Forest Department. Later (about 1920) Part of the shola area in this compartment was handed over to the Curator as an experimental orchard.

There were some natural seedlings of wattle and as they came to maturity there was stealing of bark mostly during the nights. Hence these trees above 70 in number were sold in public auction. This space is to be reclothed.

In compartment 5, there was wattle over about 2·0 acres which, when felled, was converted to blue gum.

Compartment number and species.	Acreage.	Year of planting and espacement.	Description of crop.	Past history. Quality class.	Year of felling.	Method of felling.	Age at felling.	Outturn in stacked cubic feet per acre.	Remarks.
1 Miscellaneous ..	7·20	1887–91	Aspect—South and south-west	..	..	..	..	..	A portion of this 30·50 acres forms part of the present model orchard.
Eucalyptus callitris and other species.	3·40		Slope—Gentle to moderate.						
Shola including Curator's orchard.	30·50		Soil—Shola type, red clay loam, deep and moist.						
Range officer's quarters.	0·50		Crop—Miscellaneous Eucalyptus are found in two plots, one above the Forest Lodge and the other below, in some what poor condition, free of undergrowth and with a fairly dense underwood of callitris which in a few cases has out-grown the Eucalyptus. A small patch of poorly grown grevillia robusta is found in the valley below the road and a small plot of fairly well-grown Bucklandia populeana is found near the Forest Lodge and below the road. The average girth of the trees in the latter plot is 30 inches. In the plot above, the Forest Lodge path the following trees are found :— A few Eucalyptus gunnii. A large patch of Eucalyptus tereticornis. A fairly well-grown patch of Eucalyptus panicolata. A patch of Eucalyptus saligna. A patch of well-grown Eucalyptus eugenicdes on either side of the forest. Lodge path extending up to the Lodge. Below the path are found the following :— A patch of Eucalyptus tereticornis. Specimens of ill-grown *Podocarpus elongata* and Acer oblongum. A tall tree of Eucalyptus eugenioides, one Eucalyptus maculeata and a few Eucalyptus gombogrii. There is also a patch of Syncarpia laurifolia.						
	41·60								

In addition to the above the following trees are found :—

No. 81 *Eucalyptus gunnii.*

No. 82 *Eucalyptus Navasanglica Eucalyptus viminalis.*

A few trees of *Eucalyptus corymbosa.*

A patch of *Eucalyptus aideriophloia.*

Passing through the shola area and nearing Walker's Hill road, six well grown trees of *Eucalyptus pilularis* are found. On the hill above the Forest Lodge there is a plot containing poor growth of *Eucalyptus crebra. Eucalyptus Corymbosa, Eucalyptus acaciaformis, Eucalyptus viminalis* and other varieties. Touching the bridle-path called Lover's Lane is a pretty big clump of *Dendrocalamus hamiltovia.* A narrow long strip between the Reserve forest line in the east and the bridle-path called Lover's Lane is the present Pomological garden. In the north of the compartment is a plot containing poorly grown callitris with fairly dense undergrowth of the same species. The rest of the compartment is shola of poor quality containing scattered trees of Pinus, *Acacia dealbata* and callitris.

2	....	26·5		This forms the public garden of Sim's Park and is under the control of the Curator, Government Gardens. From the Forest point of view, its main interest lies in the collection of Eucalyptus and conifers, of which a large number of different species have been planted.		..	..	..	..	..
3	....	13·3	....	Aspect—North and south .. .. Slope—Moderate. Soil—Shola type, red clay loam deep and moist. Crop—Shola of fairly good quality containing a few *Acacia dealbata* and *decurrens*, callitris, pinus and *Acacia melanoxylon.* Adjoining the Reserve Forest line in the north is found a patch of callitris amidst shola trees. This compartment is also under the control of the Curator, Government Gardens, as an annexe to the park.		..	..	..	..	..
4 (Shola evergreen scrub).		18·2	....	Aspect—North .. .. .. Slope—Steep. Soil—Shola type, red clay loam mixed with stones and boulders. Crop—Shola of poor quality containing a good number of *Acacia dealbata* and *decurrens* with undergrowth of lantana. There are five permanent leases in the compartment. Ten bluegum trees are found along the Reserve Forest line of which four are in areas under permanent lease.		..	..	..	..	..
5 Grass land .. .. Shola		2·2 3·5 5·7	....	Aspect—Level in the east and north for the rest. Slope—Moderate. Soil—Red clay loam and deep. Crop—Shola of poor quality mixed with *Acacia dealbata* in part. The part which is grass land forms part of the Golf Course of the **Wellington Gymkhana.**		..	..	..	..	..

APPENDIX XIII.

Description of the Wattle Plantation included in the Wattle Working Circle.

Name of the plantation. (1)	*Year of planting.* (2)	*Species.* (3)	*Acreage.* (4)	*Details.* (5)	*Remarks.* (6)
1 Mukurti—1950 ..	1950	*Acasia mollissima.*	555·00	The black wattle had been raised at an espacement of 11 feet × 11 feet. The initial planting was a success only to an extent of about 20 per cent. Alternate stakes were sown with seeds: others planted with mossed seedlings. In the winter of 1950, there had been many casualties due to frost bite as the seedlings were not sufficiently high and also because frost cover was confined to the plants in the hollows. In the succeeding year, the blanks were filled in, but only nursery raised seedlings were used. Even with the filling up of the casualties in 1951 only 50 per cent success was achieved. Due to the poor stocking in the area, the beating up of the blanks had to be done during 1953 also, adding 2 oz. of fertilizers to each replacement.	For every sixty rows of wattle plants 6 rows of bluegum were raised to serve as future wind belts. All plants were raised at 11 feet × 11 feet in the same year. Wattle .. 494 acres. Bluegum .. 61 „ 555
2 Mukurti—1951 ..	1951	Do.	355·00	The black wattle seedings were raised at 11 feet × 11 feet. Only nursery raised seedlings were used. No sowings done as they were not found to be suitable to the locality. A success of 75 per cent was achieved in the first year. Frost cover was done to all plants below 1½ feet in November. Early in 1952 a fire ran over the area affecting plants over 125 acres. The stocking was reduced to 50 per cent. The beating of the blanks was done by planting nursery raised seedlings. At the end of the second winter, a stocking of about 80 per cent was available.	For every 60 rows of wattle 6 rows of bluegum was raised to serve as future wind belts. All plants were raised at 11 feet × 11 feet in the same year. Wattle .. 320 acres. Bluegum .. 35 „ 355 Over 50 acres as an experimental measure, 2 oz. of fertilizers were applied to each plant. There was good initial growth. Unfortunately some of the well grown plants were browsed by Sambhur. The experiments were repeated. Though the Sambhur again interfered with the experiments, the observed good height growth attained in the manured areas made it clear that by applying fertilizers the wattle could be given a good start so as to withstand the effects of the first winter. Usually seedlings below 1½ feet were affected by frost.
3 Mukurti—1952 ..	1952	Do.	255·00	Black wattle seedlings were planted at an espacement of 11 feet × 11 feet. Two oz. of fetilizers were applied to each plant at the time of planting. Very good initial success was achieved. There was a good nursery stock for planting as well as timely rains. A stocking of 95 per cent was achieved. All blanks below 1½ feet in November were given frost cover. The casualties were replaced during 1953. This is the best plantation in the locality at present (1953).	Due to continued labour shortage, it was found necessary to limit the annual planting to about 250 acres. Labour lines were constructed to make the labour settle in the locality. For every 60 rows of wattle 6 rows of bluegum was raised to serve as future wind belts. All plants were raised at 11 feet × 11 feet in the same year :— Wattle.. .. 234 acres. Bluegum .. 21 „ 255
4 Mukurti—1953 ..	1953	Do.	272·00	The area is being planted up at present (1953)	....
5 Sholur and Lockout.	1946 to 1948	Mixture of *Acacia mollissima* and *Acacia decurrens.*	185·51	These are in two blocks. They are old pyrethrum areas converted into wattle plantations. The wattle plantations have been only partially successful and the stocking is not uniform. There was difficulty in protection against grazing and fires in the early stages. The mixed crop will be replaced with a pure crop of black wattle during the period of this plan.	....
6 Hodgson's Hill ..	1946 and 1947	Mostly of *Acacia mollissima.*	32·50	These are the few successful plantations raised in the old pyrethrum fields of the locality. They contain a good stocking of wattle.	These are in the old pyrethrum fields of Hodgson's Hill Nos. 1 to 3.

Name of the plantation. (1)	*Year of planting.* (2)	*Species.* (3)	*Acreage.* (4)	*Details.* (5)	*Remarks.* (6)
7 Ithalar	1946 and 1947	Mixture of *Acacia mollissima* and *decurrens.*	21·95	These plantations will be replanted with a pure crop of black wattle during the period of this plan. The growth is on an average satisfactory.	....
8 Kokothorai ..	1951 and 1952.	Do.	46·00	These areas had been clear-felled during 1950–51. A mass of natural regeneration had sprung up. In one area the natural regeneration is mostly of *Acacia decurrens.* The natural regeneration requires tending and spacing out of the plants to a required number. The areas will be planted with a pure crop of black wattle during the period of this plan after exploiting the existing stock.	....
9 Avaraihalla ..	1952	*Acacia mollissima.*	18·23	The old plantation of wattle was not a complete success. It had an admixture of black and green wattle. After clear-felling black wattle was raised in 1952 by planting nursery seedlings. The poor rainfall of the year adversely affected the plantation. Beating up of the blanks will be done during 1953.	....
10 Curzon Valley ..	1952	Do.	25·00	Do.	....
11 Doddabetta North.	1953	Do.	18·80	The old wattle stand which had a good growth, contained a mixture of *Acacia decurrens* and *Acacia mollissima.* The area is under felling and will be planted up with nursery raised seedlings of black wattle (1953).	....
12 Kodanad 1 and 2 ..	1947	Mixture of *Acacia mollissima* and *Acacia decurrens.*	31·07	These two plantations near Kodanad R.H. had been raised in the area where pyrethrum was grown during the world War II. They contain a good growth of wattle. As there is an admixture of black and green wattles, they will be replaced with a pure crop of black wattle during the period of this plan.	....
13 Kulear	1952	*Acacia mollissima.*	18·75	This area was raised with a mixture of black and green wattle by the Kumri method (potats). The original stand was felled and the area planted with black wattle in 1952. Many seedlings of green wattle has sprung up and they will be removed while beating up the blanks is done in 1953.	....

APPENDIX XIV.

Description of compartments in Mudumalai Range.

Compartment number. (1)	*Area in acres.* (2)	*Description of crop.* (3)	*Past management.* (4)	*Remarks.* (5)
		Theppakaddu Block.		
1	1,315	Soil—Black loam, occasionally with stones and gravel. Slope—Gentle to steep. Drainage—Good. Principal species—Teak, Grewia, venteak, mathi and vengai. Height growth poor to moderate. Crop rather open. Bambusa occurs along the Moyar and to some extent along stream banks. *Schleichera trijuga* occurs in some profusion, especially along the Moyar. There are three patches of *Shorea talura.* Regeneration of teak and venteak poor, other species fair. Tall grass (*Cymbopogon flexuosus, Themeda cymba a*) universal with intrusive patches of Eupatorium which is abundant along western boundary. Lantana occurs along the stream in the centre of the compartment.	Improvement fellings in 1910–13. Clear-fellings—20 acres in 1922. A Eucalyptus nursery was formed in 1927–28, but failed. In 1952–53—150 sandal seedlings were transplanted (9 feet × 9 feet) to the west of the subordinate's line. Failure. The 1920–24 efforts at artificial regeneration of sandal over 125 acres ended in failure. Clear-felling for conversion into teak plantations. 1940–41 15 acres 3,056 c.ft.	The Kargudi rest-house and the range colony are in this compartment. The teak nursery at lower Kargudy falls within this compartment. The Mysore-Gudalur road passes through this compartment. Teak plantations— Kargudy I 1922—20 acres. Do. II 1924—90 ,, Do. III 1925—59·5 ,, Do. VIII 1941—15 ,, Coppice area 1924–57 ,,

Compartment number. (1)	Area in acres. (2)	Description of crop. (3)	Past management. (4)	Remarks. (5)
		Theppakaddu Block—cont.		
2	940	Soil—Dark brown to black loam of moderate depth. Slope—Gentle. Drainage—Well drained. One or two swamps on the western part. Principal species.—Teak, Grewia, venteak, rosewood, mathi and vengai, Ougenia *dalberiogides*. Crop—Dense and well formed, height growth 50 to 70 feet. Canopy nearly close. Middle and higher classes well represented, lower poor. Regeneration of teak absent, other species poor to fair undergrowth of herbs, chiefly wild arrowroot and tumeric with patches of solanum species and Eupatorium.	Improvement fellings—1913–15—Northern half 450 acres. 1918–19 the whole compartment. Felling of mathi girdled in previous years and dead Vengai. Total yield—43,422 c.ft. The southern half was improvement felled between 1910-13, but yield not seperable from that of compartment-1. Clear-felling for conversion into teak plantations— 1938–39—20·2 acres. 9,440 c.ft. 1939–40—22·2 „ 7,194 „ 1940–41—20·7 „ 6,412 „ 1941–42—16·9 „ 4,919 „ 1941–42—31·8 „ 9·253 „	An inspection path from the Range office compound to the Mudumalai-Thorapalli road passes through this compartment. Teak plantations— Kargudy IV—1938—19 acres. Do. V—1939—19 „ Do. VI—1940—21 „ Do. VII—1941—19 „ Do. IX 1942—17 „ Do. X—1942—31 „
3	1,188	Soil—Black loam of poor to moderate depth. Slope—Gentle to moderate. Drainage—Good, into the Moyar and Biduruhalla. Principal species—Teak, Grewia, Ougenia and mathi, crop of variable density, height growth moderate, canopy fairly close to moderately open. Tall grass in the north and east, broad grass (*Imperata arundinacea*) to the south and short grass (*Themada imberlus*), etc., in the centre. Eupatorium scattered all over, Lantana in patches along the Mysore-Gudalur road. Bambusa occurs generally along the Biduruhalla and the Moyar, where mature clumps are absent, regeneration found.	Improvement fellings— 1914–15, 370 acres. Yield 17,455 c.ft, 1915–16, 484 acres. Yield 43,486 c.ft, 1916–17, 570 acres (balance of second operation). Yield 107 c.ft. Experimental fellings— 1916–17—3 acres. Clear-felling—1925–26. Biduruhalla regeneration area 15 acres. Clear felling for conversion into teak plantations :— 1948–49—23·5 acres. 5,687 c.ft. 1949–50—32·5 „ 12,147 „ 1950–51—25·5 „ 12,470 „ 1951–52—16·5 „ 3,600 „ 1952–53—22·3 „ ..	The Mysore-Gudalur road runs through this compartment. The foot-path from the Range office compound passes through. Wild elephants often frequent this compartment. Experimental teak plantations on Mysore road, 1916—3 acres. Teak plantations— Bidhurhalla I—1926—11 acres. Bidhurhalla-.. 1926—4 „ tuckle. Bidhurhalla II 1949—23·5 „ Do. III—1950—25 „ Do. IV 1951—25·5 „ Do V—1952—18·1 „ Do. VI—1953—22·25 „
4	1,330	Soil—Black loam. Slope—Gentle to moderately steep. Drainage—There are some swamps. Otherwise fairly good drainage. Principal species—Teak, Grewia, mathi, vengai and venteak, Anogeissus, rosewood. Crop—Moderately dense, canopy nearly close, height growth up to 60 feet. Middle girth classes well represented, high classes poor and lower fair. Regeneration of Grewia good, other species fair to poor. Undergrowth of wild arrowroot, tumeric with a sprinkling of Solanum and Helicteres. Patches of Eupatorium and Lantana. Tall grass generally found. Bamboo along the streams.	Improvement fellings— 1917–18—50 acres. Yield—6,223 c.ft. 1918–19—Yield—58,713 c.ft. 1919–20—Yield—31,373 c.ft. Experimental fellings— 1918—5 acres—in all clear-felling—1927–28. 12½ acres. Yield 4,197 c.ft. 200 acres were burnt accidentally. Clear-fellings— 1930–31—40 acres. Yield—6,466 c.ft. 1935–36—31 acres. Yield—8,505 c.ft. 1936–37—26 acres. Yield—4,470 c.ft. In 1933–34 a nursery of teak and Ceylon Satinwood was formed but failed.	The Mudumalai-Thorapalli road forms the western boundary. Wild elephants frequent this compartment. Experimental teak plantations in Mudumalad-Thorapalli road.— 1918 —5·6 acres Teak plantations— Nellikore I—1928—12·5 acres. Do. II—1931—31 „ Do. III—1935—33 „ Do. IV—1936—31 „ Do. V—1937—26 „
5	805	Soil—Black loam of moderate depth. Slope—Very gentle to moderate. Drainage—Good : into the Biduruhalla or the Moyar : a few swamps, one big swamp in the west. Principal species—Teak, mathi, Grewia, venteak, rosewood and vengai, crop of variable density, canopy rather open to fairly close, height growth up to 55 ft. Middle and higher girth classes fairly well represented, lower poor. Regenaration of teak and rosewood fair. Area more or less completely over-run by Lantana. In the northernmost corner tall grass occurs, elsewhere broad grass.	Improvement fellings— 1916–17—585 acres. Yield 23,938 c.ft. 1917–18—240 acres. Yield—701 c.ft. 1918–19—Felling of mathi and dead vengai. Yield—4,663 c.ft. 1919–20—Yield—621 c.ft.	The Mysore-Gudalur road runs through the south of the compartment. The Thorapalli-Mudumalai road runs through the southern corner. The electric transmission line from Pykara to Devarshola and clearing cut through the south of the compartment. The southern boundary line is overgrown with Lantana. There is an old elephant camp. Wild elephants frequent this compartment.

Compartment number. (1)	*Area in acres.* (2)	*Description of crop.* (3)	*Past management.* (4)	*Remarks.* (5)
		Theppakaddu Block—cont.		
6	1,363	Soil—Black loam of moderate depth. Slope—Gentle to moderate. Principal species : Mathi, teak, Grewia, ven-teak, Stereospermum, rose-wood, bombax, vengai. Crop—Fairly dense, canopy moderately close, height growth up to 55 feet. Middle girth classes well represented, other classes poor. Regeneration of rosewood, mathi, grewia, anogeissus, vengai and olea fair. Whole are overrun by Lantana.	Improvement-fellings—1919–20—Whole compartment. Yield—14,151 c.ft. Clear-felling—1925–26, 10 acres. 1926–27—Clear-felling—10 acres. 1928–29—20 acres. Yield—5,330 acres. 1929–30—30 acres. Yield—46,985 c.ft. 1931–32—40 acres. Yield—3,254 c.ft. 1932–33—15 acres. Yield—2,339 feet. 1933–34—34 acres. Yield—10,719 c.ft. Clear-felling for conversion into teak plantations— 1942–43—12 acres. 3,509 c.ft. c.ft	The Thorapalli-Mudumalai road runs along the eastern boundary. The reserve line is overgrown with lantana. Teak plantations— Cheenakolli I—1926—10 acres. Do. II—1927—10 ,, Do. III—1929—15 ,, Do. IV—1930—22½ ,, Do. V—1932—40 ,, Do. VI—1933—14½ ,, Do. VII—1934—31 ,, Do. VIII—1943—11 ,,
7	1,174	Soil—Shallow black loam, occasionally gravelly. Slope—Gentle to steep. Drainage—Good. Principal species—Teak, mathi, Grewia, Anogeissus, Kydia, rosewood, and vengai. Crop—Fair, canopy moderately close, height growth up to 55 feet. Lower girth classes well represented. Regeneration of timber species and Anogeissus fair. Undergrowth short grass. Bamboos in scattered clumps.	Improvement fellings— 1917–19—1050 acres. Yield 31,843 c.ft. Sandal was sown by the tuckle method over 10 acres in the northern portion, in 1932–33. Ninety sandalpatches were also made in a further 5 acres. The lattar failed. The 10 acres plot was burnt in 1933–34 and was resown with dhall and sandal. Burnt sandal was cut back. Jatropha cuttings were introduced in 1934. Part of the area recultivated by Kurumbans. Much browsed by game.	The Mysore-Gudalur road forms the western boundary. Much subject to fire. Contains 10 acres of sandal plantations and a few sandal plots.
8	1,042	Soil—Black loam or poor depth. Slope—Gentle to steep. Drainage—Good. Principal species : Teak, Anogeissus, mathi, rosewood, schleichera, Kydia, vengai. Crop—Fair to poor, canopy moderately close, height growth 30 to 55 feet. Higher girth classes scarce. Regeneration of teak, Anogeissus, mathi and rosewood good. Short grass universal. Lantana along the Moyar bank.	Improvement fellings— 1921–23—Whole compartment. Yield 70,645 cubic feet. A very drastic felling—amounting in places to clear-felling. Clear-felling— 1922–23—20 acres for teak plantation. In 1927–28, sandal seeds were sown over 25 acres, failure.	The Mysore-Gudalur road forms the western boundary. Lantana appears to be spreading. Contains old elephant pits. The coppice with standards (20 acres) demonstration area for the Madras Forest College lies partly in this compartment. Much subject to fire. Teppakadu I teak plantation 1922—20 acres.
9	791	Soil—Shallow black loam. Aspect—Easterly and westerly. Slope—Gentle to moderately steep. Drainage—Good. Principal Species—Teak, mathi, Anogeissus Grewia, rosewood, vengai and Schleichera. Crop—Generally poor, canopy moderately close, height growth 30 to 50 feet. Middle and lower girth classes fairly well represented. Regeneration of teak, anogeissus and rosewood fair. Dense Lantana in the south, short grass in a patch, elsewhere tall grass. Young bambusa is found along streams. There are three patches of shorea in the west of the compartment.	1925–26—336 cubic feet of rosewood were extracted. Clear-felling— 1929–30—Unauthorized felling of 24 acres by Kurumbans. A sandal plantation by the tuckle method was raised on this area. Very successful. 1932–33—13 acres (part of 40 acres clearing lying partly in compartment 9 and partly in compartment 10) felled for making sandal plantation by the tuckle method. Not successful. One area dibbled with sandal ; failure.	The Mysore-Gudalur road forms the eastern boundary. The Mudumalai, Theppakadu road passes through the southern corner. Theppakadu II teak plantations 1941—17 acres.
10	808	Soil—Black loam. Slope—Gentle. Drainage—Good. Principal species—Teak, rosewood, Anogeissus, Grewia, Stereopermum, mathi. Crop—Fair, canopy moderately close, height growth 30 to 65 feet. All girth classes fairly well represented. Regeneration of teak and rosewood fair. Lantana along stream banks, tall grass in the north and short grass in the south. Bambusa occurs along streams. A few clumps of Dendrocalamus.	In 1929–30 two sandal plots, each one acre, were formed one in dense forest and the other in open forest. Failure. The 40 acres clearing in 1932 for a sandal plantation by the tuckle method lies partly in this compartment.	The Mudumalai-Theppakadu road forms part of the western boundary. The Mysore-Gudalur road forms the southern boundary. Teak coppice area 1931—5 acres.

Compartment number. (1)	*Area in acres.* (2)	*Description of crop.* (3)	*Past management.* (4)	*Remarks.* (5)
		Theppakaddu Block—cont.		
11	929	Soil—Black loam of poor depth, with outcrops of rock. Slope—Gentle to moderately steep. Drainage—Fair, towards the Moyar; a few water-logged locations. Principal species—Teak, mathi, Anogeissus, Grewia, rosewood and venteak. Crop—Fair to poor, canopy moderately close, height growth 20 to 50 feet. All girth class fairly well represented. Regeneration of rosewood fair, other species deficient. Tall grass in the north and short grass in the south. Lantana generally along stream banks. Eupatorium invasive, in small patches. Herbaceous undergrowth in the south-west. Bambusa is found along the Moyar and streams. There are two patches of Shorea talura.	Clear-felling— 1929–30—5 acres to form a sandal plantation. Yield 1,061 cubic feet. The plantation failed.	The Mudumalai-Theppakadu road forms part of the eastern boundary The Mysore-Gudalur road runs through the compartment in the South.
12	1,629	Soil—Sandy loam, with outcrops of rock. Slope—Very gentle to precipitous along the Moyar. Drainage—Good. Principal species—Teak, Anogeissus, mathi, rosewood, vengai, Grewia, Schleichera. Anogeissus is the type of species. Teak of poor quality. Crop—Generally poor, canopy somewhat open, height growth generally up to 35 feet, except in the south-west where it is up to 45 feet. Higher girth class scarce, lower abundant. Regeneration of teak profuse in places. Short grass universal. Dense lantana along the Theppakadu-Massinigudi road. Bamboo regeneration along stream banks. There is a small patch of pure teak.	....	This compartment falls within Sigur Range, but is included in the Theppakadu block of Mudumalai range. The working plan of 1927 transferred compartments 12, 13 and 14 to Mudumalai range, but since 1930 for fire protection of these areas has been in the charge of the Sigur Range Officer. These compartments will under this plan form part of Sigur Range. Often fire burnt. The Theppakadu-Masinigudi road forms the southern boundary. Elephant capturing operations are done in this compartment.
13	2,872	Soil—Shallow black loam, often with outcrops of rock. Madigitibetta hill occurs in this area. Slope—Moderate to steep. Drainage—Good. Principal species—Teak, mathi, rosewood, vengai, Ougenia, Grewia and occasional venteak. Variable crop, generally somewhat sparse and open with height growth 30 to 65 feet. Regeneration of teak and rosewood fair. Dense Lantana in the north and in the south-east corner, elsewhere scattered. Typical undergrowth is short grass. Bambusa along the stream bank. *Dendrocalamus strictus* occurs scattered here and there. Few sandal trees in the northern boundary are found.	Clear-felling for conversion into teak plantations— 1952–53—5 acres.	This compartment lies in Sigur range, but is included in the Theppakadu block of Mudumalai range. The working plan of 1927 transferred compartments 12, 13 and 14 to Mudumalai range, but since 1930 fire protection works have been in the charge of the Sigur Range Officer. These compartments plan form part of Sigur range. The Theppakadu-Masinigudi road forms the northern boundary of the compartment. A cart-track runs along the southern boundary from near the 19th mile of the road above. There is a salt lick on the slope of Madigiti betta. Are frequented by wild elephants. Often gets burnt.
14	1,808	Soil—Black loam of fair depth, occasionally rocky. Aspect—Various. Moyar betta occurs in this compartment. Slope—Gentle to steep. Drainage—Good generally, inclined to be swampy at the junction of the Singara stream and the Moyar. Principal species—Teak (abundant) mathi, Grewia, rosewood, Anogeissus, vengai, Ougenia, crop of variable quality, in places dense and good, in others poor and open. Height growth 30 to 60 feet. Girth classes fairly well represented. Regeneration of teak and rosewood fair. Short grass occurs all over, but small patches of wild arrowroot and turmeric are found. Broad grass occurs in the north-west and southwest, small patches of Lantana and Eupatorium occurs.	Selection—Improvement felling— 1936–37—About 600 acres. Yield about 45,000 cubic feet. Clear felling— 1923–24—22 acres. Yield not known. 1925–26—5 acres, felling leaving 89 standards. Yield not known. Teak coppice area, 1923—25 acres.	The Moyar river forms the northern and western boundaries. This compartment falls in Sigur range but forms part of the Theppakadu block of Mudumalai range. There is a small shola on the top of Moyar betta. A coffee estate appears to have been formed on Moyar betta at one time and a few coffee plants still survive. A bridle path from Theppakadu climbs to the top of Moyar betta, descends on the other side and joins the Theppakadu-Masinigudi road at the 19th mile. There is an elephant camp in the compartment. Contains two coppice area (5 acres and 22 acres). The easternmost timber bearing compartment falls within the region of the south-west monsoon.

Mudumalai Block.

Compartment number. (1)	Area in acres. (2)	Description of crop. (3)	Past management. (4)	Remarks. (5)
15	1,568	Soil—Black loam of moderate depth; outcrops of rock. Punnelankarigudde falls in this compartment. Slope—Gentle to fairly steep. Drainage—Generally northerly and westerly into the Kekkanhalla and Amburhalla. A few small swamps. Principal species—Teak, mathi, rosewood, venteak, vengai, Anogeissus and Schleichera, fairly dense crop with moderately close canopy, height growth 25 to 55 feet. Higher girth classes scarce. Regeneration of teak and rosewood fair. Undergrowth is mostly tall grass, except in the south where it is short grass. Lantana occurs in the extreme east. Growth stunted towards the west. There is also some area of Anogeissus type touching the northern and western boundaries of the compartment.	Selection improvement felling— 1928–29; whole compartment; yield 35,680 cubic feet. In 1929–30 a portable saw mil l was installed by Mr. Tew. Removed by him in 1930–31.	The Mysore-Gudalur road run along the eastern boundary and the Mudumalai-Kekkanhalla road along the southern boundary.
16	1,227	Soil—Black sandy loam of fair depth. Slope—Very gentle to gentle. Drainage—Good. Principal species—Teak, mathi, Grewia, Anogeissus, vengai and rosewood. Crop—Mostly stunted, canopy moderately close, height growth 35 to 50 feet. Lower classes poorly represented. Regeneration of mathi, venteak and teak fair. Tall grass is universal with occasional intrusions of Eupatorium and Lantana. Broad grass occurs towards the northern limit, bamboo brakes along stream banks and in patches towards south-west and north-east. There is a small patch of good teak, 5 acres in extent towards the western end of the compartment, near the junction of the roads. *Shorea talura* is found over a portion on the north-west and on the south of the compartment.	Selection improvement fellings— 1927–28, whole compartment, yield 71,757 cubic feet.	The Mudumlai-Kekkanhalla road forms the northern boundary and the Mudumalai-Theppakadu road the southern boundary.
17	905	Soil—Black loam of moderate depth. Slope—Gentle to fairly steep. Drainage—Good. Principal species—Teak, mathi, venteak, rosewood, Grewia, Anogeissus and *shorea talura*. Crop—Fair stocking generally, canopy moderately close, height growth 20 to 55 feet. Middle and lower girth classes well represented. Regeneration of teak and rosewood fair. Tall grass in general, except in a big patch in the north-west corner where the undergrowth is herbaceous. Lantana occurs along stream banks. Small patches of Eupatorium. The crop is shunted towards south and east. There is a small patch (2 acres) of pure venteak of good height growth. There are two patches of *Shorea talura*. There is a small patch of good teak area 3 acres in extent near the junction of the roads in the north. Bambusa occurs along streams.	Selection improvement fellings— 1929–30; whole compartment, yield 23, 503 cubic feet. Fire occurrence— 1929–30—12 acres.	The Kargudi-Mudumalai road forms the western boundary and the Mudumalai-Theppakadu block line the southern and eastern boundaries. The Mudumalai-Theppakadu road forms the northern boundary. There is a small temple in the compartment.
18	800	Soil—Black loam, occasionally gravelly or rocky. Slope—Gentle to fairly steep. Drainage—Generally good, a big swamp in the southern part. Principal species—Teak, mathi, Grewia, rosewood, vengai and venteak. Crop—Variable in quality, but reasonably good canopy nearly close, height growth up to 70 feet. All girth classes fairly well represented, except regeneration which is deficient except for rosewood. Under growth of wild arrowroot and turmeric with shrubby growth of Solanum, Helicteres, etc. Tall grass intrusive. Bambusa along the streams.	Selection improvement fellings— 1933–34 and 1934–35; whole compartment, yield, 19,236 cubic feet. Clear-fellings for conversion into teak plantations— 1942–43, 20·8 acres—5,249 cubic feet. 1943–44, 38·0 acres—12,808 cubic feet.	The Mudumalai-Thorapalli road forms the western boundary and the Mudumalai-Kargudi road to northern boundary. Wild elephants and bisons frequent the area. Teak plantations— Ombetta III, 1943—21 acres. Ombetta IV, 1944—38 acres.

Compartment number. (1)	*Area in acres.* (2)	*Description of crop.* (3)	*Past management.* (4)	*Remarks.* (5)
		Mudumalai Block—cont.		
19	1,105	Soil—Black loam of good depth. Slope—Gentle. Drainage—Fair, a swamp in the centre and the north-east. Principal species—Teak, mathi, venteak, rosewood, Grewia and vengai. Crop—Poor to good quality, canopy nearly close, height growth up to 70 feet. Lower girth classes poorly represented. Regeneration deficient. Undergrowth of wild arrowroot and tumeric, with shrubs and a few patches of Eupatorum and Lantana. Tall and broad grass in places. Bamboos near swamps.	Selection improvement fellings— 1935–36 —Whole compartment; yield, 55,124 cubic feet. Fire occurrences— 1930–31—160 acres. Clear felling for conversion into teak plantations— 1941–42—21·5 acres, 8,563 cubic feet. 1942–43—39·0 acres, 13,080 cubic feet. 1951–52—25·03 acres, 12,470 cubic feet.	The Mudumalai-Thorapalli road forms the western and the Mudumalai-Kargudi road the eastern boundaries. There is a small well-bunded tank, as shown in map. Wild elephants and bisons frequent the compartment. Teak plantations— Ombetta I, 1942—21 acres. Ombetta II, 1943—21 acres. Ombetta V, 1944—18·2 acres. Ombetta VII, 1952—25½ acres.
20	1,358	Soil—Deep black loam. Slope—Moderate. Drainage—Good, occasional swamps. Principal species—Teak, mathi, Grewia, venteak, vengai, rosewood and Albezzia. There are four patches of this type and the crop is variable. Canopy nearly close, height growth up to 70 feet. All girth classes are well represented except the lower classes which are poor. Regeneration is poor excepting for rosewood. Undergrowth consists of wild arrowroot, turmeric with Helecteres on the inner border and some Lantana on the outer. Bamboos are present in patches.	Clear-felling over an area of 11 acres in 1924–25 (Inandakere tuckle). 1929–30 700 bamboos were cut to fence the above area. Selection fellings— 1942–43—Yield, 59,478 cubic feet. Clear fellings for conversion into teak plantations— 1947–48—22·3 acres, 7,640 cubic feet.	Mudumalai-Thorapalli road forms the eastern boundary of the compartment. The Nilambur Raja's property adjoins the southern bounadry. There is a temple near Mandakere on land belonging to Nilambur Kovilagam where it is customary for the range subordinates to offer coconuts after the capture of elephants. Teak plantations— Ombetta VI, 1948—22 acres. Inandakere tuckle, 1925—11 acres.
21	1,296	Soil—Deep black loam. Slope—Moderate. Drainage—Good. Principal species—Teak, mathi, venteak, Grewia, vengai and rosewood. Crop of variable quality. Canopy nearly close, height growth 30 to 70 feet. All girth classes are well represented excepting the lower. Regeneration poor. Undergrowth consists of herbs with weak tall grass on the borders and there is some Lantana in the east. Bamboos common in the west.	Selection fellings— 1939–40—Yield, 28,797 cubic feet.	The northern and the western boundary is the Mudumalai-Church Estate road and the eastern boundary is formed partly by Mudumalai-Thorapalli road.
22	1,498	Soil—Black loam of moderate depth. Slope—Gentle to fairly steep. Drainage—Good. Principal species—Teak, mathi, Grewia, Anogeissus, rosewood, venteak. Crop—Rather poor, canopy moderately close, height 20 to 50 feet. All girth classes are fairly represented, but higher somewhat poor. Undergrowth short grass in the north and herbs and shrubs in the south.	....	Mudumalai-Church Estate road forms the western boundary.
23	1,366	Soil—Black loam of moderate depth. Slope—Gentle to steep. Drainage—Good. Principal species—Teak, mathi, vengai, venteak, rosewood, Anogeissus. Crop—Variable, canopy nearly close, height 25 to 55 feet. All girth classes are fairly well represented. Regeneration of all species fair. Undergrowth consists of tall grass generally herbs and shrubs in small patches and two or three small bits of short grass. Bamboos are present along most of the stream banks.	Selection fellings— 1940–41—Yield, 22,889 cubic feet.	Mudumalai-Benns and Mudumalai Church Estate road form the eastern boundary.
24	986	Soil—Black loam of medium depth; occasionally rocky. Slope—Moderate to steep. Drainage—Good. Principal species—Mathi, teak, Anogeissus, Grewia, vengai and rosewood. Crop—Moderately, canopy moderately close height growth 30 to 50 feet. All girth classes are fairly represented. Regeneration fair of all species. Undergrowth tall grass generally with a few small patches of Eupatorium here and there. Bambusa occur along the stream banks. Small patches of *Shorea talura* occurs.	Selection fellings— 1947–48—Yield, 44,556 cubic feet.	....

Compart-ment number. (1)	*Area in acres.* (2)	*Description of crop.* (3)	*Past management.* (4)	*Remarks.* (5)
		Mudumalai Block—cont.		
25	1,291	Soil—Black loam, with some outcrops of rocks. Slope—Moderately steep to steep. Drainage—good. Principal species—Teak, mathi, venteak, vengai, anogeissus, Grewia, stocking fair, canopy moderately close, height 36 to 65 feet. All girth classes are fairly represented. Regeneration of teak and mathi fair and the rest poor. Undergrowth tall grass generally with scattered lantana. Shrubs and herbs here and there. There are three patches of Shorea.	Selection fellings 1948–49 and 1949–50 yield 53,912 c.ft.	Juldarai-Honuratty road forms the northern boundary and Mudumalai-Benne road a part of southern boundary.
26	2,097	Soil—Deep black loam .. .. .. Slope—Gentle to moderately steep. Drainage—good. Principal species—Teak, mathi, venteak, Grewia, vengai, rosewood. Crop—Moderately dense, canopy nearly close, height growth up to 70 feet. Higher and middle girth classes are well represented but lower poor. There are some bamboo clumps in this area. Regeneration fair of venteak but the rest poor. Undergrowth consists of both herbs and shrubs and Eupatorium in small patches, tall grass on the border. Bamboos also found Lantana common.	Clear felling—22¼ acres. .. .. Selection felling 1938–39 yield 70,564 c.ft.	There is a small plantation *Grevillia robusta* and mahogony near the shooting hut. There is an old well near the swamp close to the shooting hut. Mudumalai-Benne road form the southern boundary and part of the western boundary of the compartment. Mudumalai-Doddakatti road forms the eastern boundary. Fires common. 1869–75 Mudumalai teak plantation 22¼ acres.
27	1,152	Soil—Black loam of variable depth .. Slope—Gentle to moderate. Drainage—Good. Principal species—Venteak, teak, Grewia, vengai, rosewood. Crop—Variable in quality canopy nearly close, height growth 65 feet higher and medium girth classes are well represented but lower regeneration poor. Undergrowth few consists of wild arrowroot and tumeric and weak tall grass on the boundary. There is a good deal of bambusa in patches. Lantana found scattered.	1927–28 There was an accidental fire in the elephant camp. Selection improvement fellings—1930–31 whole compartment yield 53,085 cubic feet.	Mudumalai-Doddakatti road forms the eastern and Mudumalai-Kakkakanhalla the southern boundary.
28	3,755	Soil—Black loam of moderate depth .. Slope—Gentle to fairly steep. Drainage—Good. Principal species—Teak, mathi, vengai, anogeissus, rosewood. These are found in small patches in the south and east and the crop is fair to stunted. Canopy moderately close, height 20 to 45 feet, middle and lower girth classes fairly well represented and higher poor. Regeneration, teak and Anogeissus fair and the rest poor. Undergrowth consists of weak tall grass. Wild dates also are found. *Shorea talura* found commonly in the northern and eastern parts of the compartment. Anogeissus latifolia is characteristic in patches all over the compartment.	....	Jaladari-Hanurhatti road forms the northern boundary. Mysore State forest lies beyond the eastern boundary. Mudumalai-Doddakatty road runs through the compartment.
			Benne Block.	
29	930	Soil—Light black loam with red loam in the west. Slope—Gentle to steep. Drainage—Good. Principal species—Teak, mathi, venteak, vengai, Anogeissus, rosewood. Crop—Fairly dense, canopy moderately close, height growth 30 to 60 feet. Higher and middle girth classes well represented on the lower slopes, lower poor. On the higher slopes, middle and lower well represented and the higher poor. Regeneration of teak and rosewood fair. Tall grass universal with very small patches of herbs and shrubs. Lantana is present along some stream banks and it is dense near the block line. Bamboo is present on the banks of Benne hole. There are very narrow fringes of semi-evergreen forest along some of the stream banks. There is a patch of *Shorea talura* in the west.	1864–75 Teak plantation 2¼ acres .. Selection fellings—1951–52 and 1952–53 yield during 1951–52 is 39,391 cubic feet.	Jaladari road runs in the north exploitation road runs on the east of the compartment. Mudumalai Benne road forms the southern boundary of the compartment.

Compartment number. (1)	Area in acres. (2)	Description of crop. (3)	Past management. (4)	Remarks. (5)
		Benne Block—cont.		
30	1,290	Soil—Black loam of fair depth .. .. Slope—Gentle to moderately steep. Drainage—Good. Principle species—Teak, mathi, Grewia, venteak, vengai, rosewood. Crop—Variable in quality getting poorer in the north. Canopy nearly close, but in the north rather open. Height growth 35 to 55 feet. All girth classes are fairly well represented. Regeneration of teak and rose wood fair and the rest poor. Undergrowth consists of tall grass generally with very small patches of herbs and shrubs here and there. Lantana is fairly dense in the south-west. Bamboo occurs along the stream banks.	Selection fellings—1952–53 ..	Old Jaladari road (now a footpath used rarely) runs in the north of the compartment. Mudumalai-Benne road forms the southern boundary. 1864–75 teak plantations 40 acres.
31	1,290	Soil—Black loam of moderate depth .. Slope—Gentle to fairly steep. Drainage—Good. Principle species—Teak, mathi, Grewia, venteak, rosewood. Crop—Fair canopy moderately close. Height growth 25 to 60 feet. All girth classes are fairly represented. Regeneration of teak and Grewia fair and the rest poor. Undergrowth short grass and dense lantana in the south, short grass in the west, in the centre herbs and shurbs, elsewhere tall grass. Bamboo is present here and there along the stream banks and hollows. There are three *shorea talura* patches in the compartment. A small ever-green patch in the south-east corner. Principal species—*Hydrocarpus wightiana, Palaquium ellipticum, Schlichera trijuga, Artocarpus hirsuta, Michelia champaka.* Stocking—Good, canopy—close, height—75 feet. All girth classes are represented. Regeneration—Fair. Undergrowth—Shrubs.	Selection felling—1953–54	Benne-Muthanga road forms the southern boundary of the compartment.
32	806	Soil—Moderately deep black loam with some admixture of red. Slope—Gentle to fairly steep. Drainage—Good. Principal species—Teak, mathi, Grewia, vengai, rosewood. Crop—Good to fair. Canopy—Moderately close. Height growth up to 70 feet. Middle girth classes over represented and the rest poor. Regeneration of all species poor. Undergrowth—Bamboos mixed with tall grass, in places the ground floor is more or less clean. Very narrow fringes of semi-evergreen forest are found along some of the streams and in the valleys.	Clear felling 15¾ acres .. .. 1907 Teak plantation 2¾ acres. 1917 teak plantation 13 acres.	The Benne house and the subordinates quarters lie in this compartment. There are some very old elephant pits. Benne-Muthanga road forms the northern boundary of the compartment.
33	980	Soil—Red loam with a thin layer of black loam on the surface. Slope—Gentle. Drainage—Good. Principal species—Mathi, vengai, venteak, rosewood, occasionally teak. Crop—Good, canopy close, height growth 70 feet. Medium and higher girth classes well represented but lower poor. Regeneration of rosewood good and the rest fair. Undergrowth consists of shrubs and herbs with Bambusa regeneration and scattered Lantana. A more ever-green type of forest occurs in very small patches mostly on the banks of Mukkatti hole and it sometimes contains deciduous timber species of non-teak class above, indicating a transition from the deciduous to the evergreen forest. There are some Dendrocalamus clumps on the hill tops and reeds along Mukkatti hole.	Clear felling 5·6 acres .. 1907 Teak plantation 5·6 acres ..	Benne-Mukkatti road forms the eastern boundary of the compartment.

Compartment number. (1)	*Area in acres.* (2)	*Description of crop.* (3)	*Past management.* (4)	*Remarks.* (5)
		Benne Block—cont.		
34	866	Soil—Black loam mixed with red loam. Slope—Gentle to steep. Drainage—Fair. Principle species—Mathi, venteak, rosewood, Grewia, Bischoffia. Crop—Fair; canopy nearly close, height, growth about 60 feet. Higher and middle girth classes well stocked. Regeneration fair of rosewood. Undergrowth consists of bamboo in all stages mixed with scattered lantana and weak short grass. Patches of tumeric on stream banks. Shrubs and Eupatorium are found in small patches here and there. There is a patch of tall grass in the south Attikunnu. A semi evergreen type is found along the stream banks but there are two fairly large patches in the west of the compartment and one on the east. On the borders of this type mathi, venteak and rosewood of fairly large size are found. Both Bambusa and Dendrocalamus are present. The former on the lower slopes and latter on the higher slopes. There is thick growth of reeds along Mukkatti hole.	....	Gudalur-Sultan's Battery road forms the western boundary and Benne-Mukkatti road forms the eastern boundary of the compartment.
35	1,207	Soil—Deep black loam .. .. .. Slope—Gentle to moderately steep. Drainage—Good. This type is in three patches, one in the west, north of Thavanavayal and two in the east. Principle species—Mathi, venteak, rosewood, Grewia and a few teak. Crop—Good, canopy, very nearly close; height, growth 70 feet. Higher and middle girth classes well represented. Regeneration of venteak and rosewood fair. Undergrowth consists of shrubs and herbs with scattered Lantana and bamboo. There are also two patches of tall grass in the eastern half of the compartment. A semi-evergreen growth is found in patches in the western half of the compartment along stream banks and low lying grounds. On the borders of these patches deciduous timber species are found.	One Chappa Chetty has been given 20 acres of land in Thavanavayal for cultivation on condition that he would supply 20 coolies for departmental works. The southern boundary which had been overgrown with lantana was cleared to a width of ten feet. 1929–30—127 cairns on the southern boundary were rebuilt at a cost of Rs. 60.	Benne-Mukkatti road forms the western boundary of the compartment. There is an old road (part of old Gudalur-Sultan's Battery road) running through the compartment.
36	1,024	Soil—Black loam of variable depth .. Slope—Gentle to moderately steep. Drainage—Good. Generally stocking fair but the portion adjoining Mukkatti road and on hill tops is rather poor. Canopy moderately close except near the road when it is nearly open. Principal species as in the previous compartment. Height growth 30 to 70 feet. The growth is good near the eastern boundary. Regeneration of rosewood and venteak fair. Undergrowth consists chefly of lantana and bamboo found in different densities. Tall grass and small patches of herbs, shrubs and fen patches of Eupatorum are intermingled. There are very narrow strips of semi evergreen forest along some of the streams. There are a few clumps of Dendrocalamus here and there.	....	The northern and the western boundaries are formed by Mudumalai-Mukkatti road (via) Benne.
37	1,158	Soil—Reddish black loam of fairly good depth. Slope—Gentle to fairly steep. Drainage—Moderate to good. Principle species—Teak, mathi, Grewia, venteak, rosewood, Gmelina. Stocking moderate in the lower slopes, but rather poor higher up. Canopy moderately close, height, growth up to 60 feet. Middle girth classes well represented. Regeneration of venteak and mathi fair. Undergrowth: Tall grass universal with very small patches of herbs, shrubs and scattered Lantana. There is one big patch of herbs and shrubs near Vellarankolly. There are some Dendrocalamus in the compartment. Bambusa is found along Benne hole.	....	Mudumalai-Benne road forms the northern boundary of the compartment.

Compartment number.	*Area in acres.*	*Description of crop.*	*Past management.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)
		Benne Block—cont.		
38	785	Soil—Black loam of fairly good depth .. Slope—Gentle to steep. Drainage—Good. Principle species—Teak, mathi, venteak, rosewood, vengai, Cedrella. Stocking fair on lower slopes but poor on the higher, canopy-moderately close. All girth classes are fairly represented. Height growth up to 70 feet. Regeneration fair of all species but teak poor. Undergrowth consists of tall grass generally and lantana is dense to the north of Vellarankolly enclosure.	Selection fellings—1950–51 and 1951–52. Yield 54,750 c. ft.	Mudumalai-Benne road forms the northern boundary of the compartment.
39	1,206	Soil—Black loam of variable depth .. Slope—Gentle to steep. Draingae—Good. Principle species—Teak, mathi, venteak, Grewia, rosewood, vengai. Stocking fair, canopy, moderately close, height 30 to 55 feet. All girth classes are well represented. Regeneration of teak poor and the rest fair. Undergrowth consists mainly of tall grass with very small patches of Eupatorium here and there. There is one patch of herbs in the centre. Bambusa is found along the streams.	Selection fellings—1949–50 and 1950–51, yield 1,06,524 c. ft.	Do.

APPENDIX XV.

Description of Teak Plantations in Mudumalai Range.

Name of plantation.	*Year of planting.*	*Compartment number.*	*Area in acres.*	*Details.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
Benne	1864–75	29 & 30	42·25	Soil—Reddish loam. Crop—Considering the age of the plantation the growth is poor. The poor growth is probably also due to neglect in the early years. The plantation contains too many stems per acre. There are a few small patches of fairly good growth here and there. About one third of the area to the west is very poor, where lantana has come in ; the rest of the area contains herbs and shrubs with occasional tall grass and lantana. In the small area near the stream (2·25 acres) there are bamboo clumps also.	Originally a greater area about 101 acres including 22·25 acres at Mudumalai, had been planted but a good portion of it has disappeared and only about 65 acres are now existing. In 1913, 5 acres on the west were thinned. In 1916–17, 7 acres were lightly thinned. In 1917–18, 6½ acres thinned. In 1919–20, 2 acres thinned. In 1923–24, 20 acres thinned. and in 1929–30, the upper storey was lightly thinned.
Mudumalai	1869–75	26	22·25	Soil—Red loam of medium depth. Crop—Fairly well grown. Definitely better than the Benne plantation ; undergrowth of shrubs mixed with tall grass and occasional lanatana. The lower part of the west is poor ; plantation improves towards east. Occasional well grown rosewood is found in the plantation.	Originally a large area appears to have been planted. 1909–10, 4 acres thinned. 1910–11, 10 acres thinned. 1913–14, 100 poles extracted. 1914–15, balance area thinned. 1920, the great fire passed through the plantation. 1921–22, thinned. 1922-23 coppice shoots were thinned leaving two shoots per stool.
Benne tuckle I	1907	22	2·75	Soil—Brown sandy loam. Crop—Moderately well grown teak plantation. Open in many places Undergrowth consists of herbs an ; shrubs chiefly, but lantana and bamboo also occur here and there.	This area seems to have been lost sight of till about 1922 and so its previous history is not known.

Name of plantation.	Year of planting.	Compartment number.	Area in acres.	Details.	Remarks.
(1)	(2)	(3)	(4)	(5)	(6)
Benne tuckle II	1907	23	5·60	Slope—Moderate. Soil—Brown sandy loam. Crop—Plantation of moderate growth. Lantana is found throughout the area, though not dense. There is a big patch of herbs in the centre, elsewhere short grass. Bamboos are also found in the area.	About 10 acres planted with teak, vengai and Mahogany, most of which died. 1910–11 5 acres cleared and planted with teak, vengai, Mahogany, and rosewood and the area fenced. 1911–12, 7 acres cleared and planted. 1920–21, Artocarpus hirsuta (aini) seeds were dibbled over 3¾ acres. 1921–22, sowing of aini seeds. Clearing lantana where teak existed. Erythrina cuttings introduced but totally failed. About 95 per cent of aini also died. 1922–23 aini dibbled over an acre. 1923-24 lantana cleared. 1924–25 Teak casualties replaced. 45 aini survivors. Lantana uprooted. 1925–26 Lantana cleared.
Experimental plots near 38/2 mile-stone on Ooty-Mysore road.	1916	3	3·00	Slope—Gentle. Soil—Reddish loam. Crop—This is in 3 plots as described in the next column. In plot II the seedling growth is moderate with very little undergrowth of short grass and shrubs. In the other 2 plots, I and III, only coppice shoots survive.	Three plots of one acre each was opened. Plot I was clear-felled of everything but Teak. Plot II was clearfelled of everything and dibbled with soaked teakseeds at 4 feet × 4 feet. Plot III was clear-felled. 1917—Plots I and III were burnt. 1919–25 Natural regeneration failed. Various other sowings, burnings, etc., were carried out and the seed bearers in plot I removed. Thinning carried out in 1936.
Benne tuckle III ..	1917	32	13·00	Slope—Gentle to fairly steep. Soil—Brownish sandy loam. Crop—If unequal growth, moderate in the best patches and in other places poor, undergrowth of lantana which is dense in patches, interfering with the teak. In other places herbs and tall grass are found with a few clumps of bamboos (Dendrocalamus).	The field crop failed in the first year. 1918–19 Teak planted. 1919–20 The plantation failed, and it was cleared, burnt and replanted with seedlings raised from Nilambur seeds. Lantana uprooted from 1920–26.
Experimental plots on Mudumalai-Thorapalli road near the blockline.	1916	4	3·00 1·40 0·46 0·50 5·36	Slope—Moderate. Soil—Reddish loam. Crop—Plot I. The crop is fairly good except in patches where it is poor. Undergrowth chiefly shrubs and *Eupatorium* and in many places nothing. Lantana is very small patches. Growth habit of trees fairly clear. Plots II, III and IV—The crop is fairly good with undergrowth of shrubs and *Eupatorium*.	The object of opening the plot was to make up for the absence or scarcity of natural regeneration, by artificial regeneration of selected patches with teak. 1922–23 Certain areas planted with teak stumps. Allowing for the difference in ages there is little to choose between the results of transplanting and stump planting. Cost not available. Plot I thinned in 1935. Plot II thinned in 1935 (above the road) Plot II thinned in 1936. (below the road) Plot III thinned in 1936. Plot IV thinned in 1935. There were fires during 1948–49 and 1950–51 in all the plots.

Name of plantation. (1)	Year of planting (2)	Compartment number. (3)	Area in acres. (4)	Details. (5)	Remarks. (6)
Kargudi I	1922	1	20·00	Slope—Gentle to steep. Soil—Reddish gravelly loam. Crop—The plantation is a failure. Only the stump planted area in the south and centre contains reasonably fair growth, elsewhere, especially, so in the north it is miserably poor with very large blanks and forked stems. Undergrowth consists of lantana. Eupatorium and some tall grass in the west, elsewhere tall grass.	After being clearfelled and burnt, the whole area was dibbled with teak seeds. 27 feet × 27 feet. Coppice shoots were thinned leaving 2 shoots per stool. 1923–24—Out of the 20 acres, 9 acres were divided into 3 plots. These were planted with teak stumps at the following espacement:—Plot I—13½ feet × 13½ feet. Plot II—9 feet × 9 feet. Plot III—6½ feet × 6½ feet. 1924–25—Blanks were filled up in the above 9 acres. In March 1925 the area was burnt in the hope of stimulating teak and reducing grass. 1925–26—Cutting back damaged plants after the burn and filling blanks. Again area was burnt in March 1926 and damaged plants cut back. Thinned in 1936. Cost—Rs. 428–9–6. Fires during 1924–25, 1925–26, 1948–49 and 1950–51.
Teppakadu I	1922	8	20·00	Slope—Moderate. Soil—Brown sandy loam with gravel. Crop—The plantation is very poor, but is not a total failure. The crop consists largely of coppice shoots; but a good many seedling trees have survived. Fairly well stocked but growth poor. The plantation is definitely an improvement on the surrounding jungle. Undergrowth sparse low shrubs and lantana.	Dibbled with teak seed in patches 12 feet × 12 feet germinated 20 per cent. 1923–24 Tending of coppice shoots. 1924–25—Pruning. Cost of the plantation excluding the cost for burning and dibbling Rs. 164–10–0. Fire during 1950–51.
Kargudi II	1924	1	90·00	Slope—Gentle to moderate. Soil—Brown gravelly loam. Crop—Crooked and branchy throughout but in patches fairly good. The chief undergrowth is tall grass with patches of lantana, Eupatorium and shrubs. Soil generally unsuitable and espacement evidently too wide, but stocking reasonably good. The plantation as a whole is not a success.	1920–25 Teak stumps obtained from Nilambur, planted 15 feet × 15 feet. Soil worked and mulched at intervals. Results deplorable. In March 1925 the area was burnt and damaged. Teak cut back. 1925–26 the burning had little, if any, beneficial effect. Blanks were filled with stumps. In March 1926 the area was again burnt under Chief Conservator's orders. 1930–31 A very fierce fire burnt the area. Plots II and III where vengai and rosewood were sown at the same time are complete failures. Cost of plantation up to 1925–26 Rs. 2,304–10–6. Thinned in 1925.
Kargudi III Plot I	1925	1	7·75	Slope—Moderate. Soil—Brown sandy loam. Crop—Badly shaped and stunted. Overgrown with tall grass and lantana.	1925–26 Two year teak stumps planted in prepared pits 12 feet × 12 feet. Patch weeded. 1926–27 Blanks filled by stump planting. Cost of plantation Rs. 311–8–0. Thinned in 1935 and 1947. Fires occurred in all the plots in 1948–49.
Plot II	1925	1	7·75	Slope—Moderate. Soil—Black. Crop—Continues to be better than plot I, above, although poor. Undergrowth chiefly tall grass with some lantana.	Teak seeds sown in prepared patches 6 feet × 6 feet. Patch weeded. 1926–27 Casualties replaced. Cost of plantation Rs. 145. Thinned in 1935 and 1947.

Name of plantation. (1)	*Year of planting.* (2)	*Compartment number.* (3)	*Area in acres.* (4)	*Details.* (5)	*Remarks.* (6)
Kargudi III Plot III ..	1925	1	7·75	Slope—Moderate. Soil—Black. Crop—Stunted and poor in upper parts. Fairly good in lower parts. Fully stocked. Undergrowth shrubs, but in upper parts, there is tall grass. Canopy—Nearly open to fairly close.	Teak seeds dibbled 4½ feet × 4½ feet. Patch weeded. 1926–27—Replacing casualties. Cost of plantation—Rs. 162–8–0 Thinned in 1935 and 1947.
Plot IV	1925	1	7·75	Slope—Moderate. Soil—Black. Crop—A little grass has come in as well as shrubby undergrowth. Well stocked a fair plantation. Height growth in lower parts good.	Teak seeds sown in prepared patches 6 feet × 6 feet clean-weeded. 1926–27—Replacing casualties. Cost of plantation Rs. 133–13–0. Thinned in 1935 and 1947.
Plot V	1925	1	1·05	Slope—Moderate. Soil—Black. Crop—A failure.	This was originally planted with Eucalyptus robusta seedlings, 6 feet × 6 feet, but it was a total failure. 1926–27—Sandal dibbled 6 feet × 6 feet. Cost of plantation of Eucalyptus robusta, Rs. 70–1–0. Cost of sandal seeds dibbling and weeding Rs. 9. Very poor germination. The few seedlings that resulted died out later.
Plot VI	1925	1	11·00	Slope—Moderate. Soil—Black. Crop—This is the best plantation in the compartment, well stocked and of good height. Undergrowth consists of shrubs.	1925–26—Two year old teak stumps planted in prepared patches. Patch weeded. 1926–27—Replacing casualties. Cost of plantation Rs. 432–15–0. Thinned in 1935 and 1947.
Plot VII	1925	1	1·00	Slope—Moderate. Soil—Brownish loam. Crop—There is some teak, but of poor growth. The plantation is very bad. The shorea was a complete failure.	Area left fallow for one year after felling. 1924–25—Area burnt. 1925–26—Teak seeds dibbled 6 feet × 6 feet and shorea talura seed broadcasted—Patch weeded. Cost of plantation Rs. 52–6–0. Thinned in 1935 and 1947.
Plot VIII	1927	1	1·00	Slope—Moderate. Soil—Brownish loam. Crop—Gmelina none. Teak stumps appear to have been planted in 1927. Bad plantation, overgrowth with lantana.	Gmelina arborea seed were sown originally 6 feet × 6 feet and patch weeded. 1926–27—Replacing casualties. Total failure. Cost of Rs. 29–14–0. Thinned in 1935 and 1947.
Plot IX	1925	1	2·00	Slope—Moderate. Soil—Reddish loam. Crop—Fairly well stocked. Height growth good. Lantana has come in but is not dense. The Chief undergrowth is herbs with some tall grass.	The area was left fallow after felling in 1922–23. 1924–25—Regrowth cut and area burnt. 1925–26 Soil worked 1 inch or 2 inches deep, grass roots dug up and burnt. Teak seeds dibbled 6 feet × 6 feet. Ragi broadcasted. Area fenced. 1926–27—Stumps planted over one acre in the eastern half and in the other acre soil worked and dibbled again in blanks. Ragi was again sown. Cost of plantation after deducting the revenue realized by ragi, Rs. 8–12–0. Thinned in 1935 and 1947.
Plot X	1925	1	12·00	Slope—Moderate. Soil—Reddish loam. Crop—The clean weeded area (X-a) is much better in height, habit and density. Lantana is present but is doing no harm. The patch weeded area (X-b) is poorly stocked, trees badly shaped and is a sea of lantana.	The area was left fallow after felling in 1922–23. 1924–25—Regrowth cut and area burnt. 1925–26—Teak seeds sown 6 feet × 6 feet ha the area clean weeded and the other half patch weeded. 1926–27—Replacing casualties. Cost of plantation Rs. 689–6–0. Thinned in 1935 and 1947.

Name of plantation.	*Year of planting.*	*Compartment number.*	*Area in acres.*	*Details.*	*Remarks.*
(1)	(2)	(3)	(4)	(5)	(6)
Inandakere tuckle ..	1925	20	11·00	Slope—Gentle to moderate. Soil—Black loam. Crop—Height and growth habit fair, branchy and stag headed. There are occasional small patches of good growth. Undergrowth consists mainly of Solanum, grass, Eupatorium in patches. No rosewood in the crop except a few seedlings. Undergrowth is mostly of wild arrowroot.	The area was given to a Chetty for tuckle in 1922. 1924–25 The area was cleared and partly cultivated with ragi. It was recleared and burnt. 1925–26 Teak dibbled 4½ feet × 4½ feet. 1926–27 Replacing casualties There were some rosewood patches and they were fenced. 1927–28. Casualties replaced. 1933–34 Weeding and tending. Cost of the plantation Rs. 487–6–0.
Biduruhalla I	1926	2	11·00	Slope—Gentle. Soil—Reddish loam. Crop—A fairly good plantation, growth habit clean. On the higher slope not so good as on the lower. Undergrowth consists of herbs and shrubs. Lantana surrounds the plantation. In some places fire coppice found.	The area was divided into B plots of 5½ acres each. Plot I (Adjoining the halla) two years old stumps planted 6 feet × 6 feet. Plot II teak seeds dibbled 6 feet × 6 feet. Casualties replaced as required. Both plots clean weeded. 1927–28 Casualties replaced. 1934—Lightly thinned. Cost of plantation Rs. 521–5–0. The plantation was accidentally burnt in 1936—7 acres. Thinning in 1949–50.
Biduruhalla tuckle ..	1926	3	4·00	Slope—Moderate. Soil—Black. Crop—Fairly satisfactory growth, undergrowth of creepers, shrubs and clumps of bamboos. Thinned during 1949–50.	This area was divided into four plots of 1 acre each. Plot I—Two year old teak stumps planted 6 feet × 6 feet. Plot II teak seeds dibbled 6 feet × 6 feet. Plot III teak seeds dibbled 6 feet × 1½ feet. Plot IV—Venteak dibbled 6 feet × 6 feet which failed to germinate; was then stump planted with teak of 2 years old. Lengthwise the plot was subdivided into three again. The middle one was sown with horsegram and in other places with ragi; failed. The whole area was broadcast with seeds of *Albezzia lebbek* and vengai. 1927–28 Casualties replaced Ragi was sown again. Cost of plantation after deducting the revenue realized by ragi Rs. 249–10–5.
Cheenakolly I	1926	6	10·00	Slope—Moderate. Soil—Reddish loam for fair depth. Crop—Not tuckled. The eastern portion of the plantation is decidedly better than the western half. Lateral branches prominent. In patches, lantana has been distructive. Undergrowth mostly shrubs, Eupatorium dense.	This area was sub-divided into three equal plots. The middle one (Plot II) was dibbled with teak and the lower half of the same plot was dibbled with Albezzia lebbek on one side of the stake and teak on the other. The other two plots were stump planted with teak. No noticeable difference in growth of teak. The Albezzia failed. Cost of plantation—Rs. 657–11–0. Thinned in 1936. and 1941. There were fires during 1948–49 and 1950–51.
Cheenakolly II ..	1927	6	10·00	Slope—Moderate. Soil—Dark brownish loam of moderate depth. Crop—Tuckled with ragi. Stocking but fair blanks occur in places due to suppression by lantana. Lateral branches common. Undergrowth—Lantana prominent in many parts where it is destructive. In other places herbs and shrubs are found. Eupatorium aggressive.	An attempt to raise a crop of ragi in the second year was made but it was a complete failure, owing to failure of rain and weed growth. Cost of plantation excluding the cost of ragi Rs. 586–2–0. Thinning done in 1936. There were fires during 1948–49 and 1950–51.

Name of plantation. (1)	*Year of planting.* (2)	*Compartment number.* (3)	*Area in acres.* (4)	*Details.* (5)	*Remarks.* (6)
Nellikere I	1928	4	12·5	Slope—Moderate. Soil—Dark-brownish loam of moderate depth. Crop—Tuckled with ragi. The growth is fairly good on the roadside but higher up it is poor. Undergrowth, Lantana in many places oppressive. Eupatorium is found here and there. Tall and short grass in other places. Bamboo regeneration occurs in some places.	6½ acres were dibbled with teak seeds for want of sufficient number of stumps. The remaining 6 acres were stump planted. In the top road 48 Eucalyptus plants were planted but failed. Cost of plantation up to 1930–31 Rs. 749-7-0 excluding the cost of ragi. Thinned in 1935 and 1950–51.
Cheenakolly III	1929	6	15·00	Slope—Moderate. Soil—Dark Brownish loam of moderate depth. Crop—Tuckled with ragi. Parts here and there are good but the rest overcome with lantana ; growth variable. Undergrowth—Lantana is common and tumeric, shrubs and Eupatorium are found in patches. Canopy—In small patches it is fairly close and in many places open.	To the south of this plantation 5 acres were broadcasted with seeds of mathi and rosewood ; it failed. Lantana was uprooted by elephants in 1933–34. Cost of plantation Rs. 458-11-0 excluding the cost of ragi sold. Thinning in 1936–37. Fires occurred during 1948–49 and 1950–51.
Cheenakolly IV	1930	6	22½	Slope—Moderate. Soil—Dark brownish loam of moderate depth. Crop—Tuckled with ragi. About ¾ of the acre is infected with lantana which is throttling the saplings. Stocking in this part is poor. In the remaining area which is said to have been planted with stumps got from Wynaad, the growth is fair and in some places good. Lantana is under control here. Canopy Fairly close in 4½ acres elsewhere it is open but for lantana.	In addition to the 22½ acres 1½ acres were sown with mathi, vengai and rosewood seeds. A failure. Since the stumps that were got from the nursery was not sufficient for the whole area about 4½ acres were sown with teak seeds. The 4½ acres failed and the casualties were replaced with stumps got from Wynaad. Thinned in 1936. There were fires during 1948–49 and 1950–51. Cost upto 1934–35 excluding the amount realised by ragi Rs. 935.
Neelikeri II	1931	4	31·00	Slope—Moderate. Soil—Dark brownish loam. Crop—Western half, close to the road tuckled and the other not tuckled. The tuckled area contains fair growth being in the lower slope, with undergrowth of Eupatorium, some shrubs and occasional Lantana. Top portion poorly stocked. Open with forked lateral branches with dense tall grass Eupatorium and lantana. Canopy—Fairly close near the roadside but higher up it is open.	In the eastern portion 7 acres were dibbled with teak seeds. The rest of the area was stump planted. To the east of this plantation, 9 acres were dibbled with mathi and vengai seeds but completely failed. Cost upto 1934–35 excluding the revenue realised by ragi Rs. 1,806-6-0. Thinning in 1952–53.
Cheenakolly V	1932	6	40·00	Slope—Moderate. Soil—Dark brownish loam generally and black loam in the hollows. Crop—Fairly good but in places poor. The area is one sea of Lantana thickest with saplings of teak heading through it.—Canopy, open.	In this 40 acres 10 acres, were dibbled with teak along with rosewood, mathi, venga and venteak seeds in the following order : Four rows of teak and rosewood, four rows of teak and mathi, four rows of teak and vengai and four rows of teak and venteak. The miscellaneous species completely failed. In the remaining 30 acres, 7 acres were dibbled with teak seeds taken from the dumpbeds. The rest of the area was planted with stumps and 20 acres were tuckled with hill paddy which yielded a very poor crop. Cost excluding the value of paddy and straw up to 1935–36—Rs. 2,461-5-0. Thinning done in 1941–42. Fires occurred during 1948–49 and 1950–51.

Name of plantation. (1)	*Year of planting.* (2)	*Compartment number.* (3)	*Area in acres* (4)	*Details.* (5)	*Remarks.* (6)
Cheenakolly VI	**1932**	**6**	**14·05**	Slope—Moderate. Soil—Reddish loam. Crop—The growth is fair. Damage by phassus found here and there. Undergrowth chiefly consists of compositae herbs, Solanum and some Eupatorium.	In 8 acres stumps were planted in pits and in the rest of the area stumps were planted in crow-bar holes. No significant difference in growth observed, area was tuckled with ragi got from Coorg. In one acre out of the remaining 6½ acres one row of rosewood was planted after three rows of teak stumps. The rosewood is a failure. Cost of plantation—less value of ragi Rs. 367–5–0. Fires occurred in the year 1948–49 and 1950–51.
Cheenakolly VII	**1934**	**6**	**31**	Slope—Moderate. Soil—Reddish loam. Crop—The growth is poor and especially so on the higher slope. Appreciable damage by Phassus is found. Undergrowth consists of composites herbs with occasional patches of tall grass. Half the area towards 1929 plantation is infested with Lantana. Tendings done twice in 1936, thrice in 1937 and 1938 and once in 1946.	In addition to the 31 acres planted with teak, 3 acres were planted with rose wood, but the latter as a faliure. Twenty-six acres were tuckled with ragi and 5 acres were left untuckled. Out of this 26 acres, only 10 acres were done departmentally and the balance was cultivated by Chetties and Kurubars. 13,400 teak stumps were got from Coimbatore and Wynaad districts. Cost of plantation thinned in 1949 excluding the cost of ragi Rs. 922–0–6.
Nellikere III]	**1935**	**4**	**33**	Slopes—Moderate. Soil—Reddish loam. Crop—This promises to be a good plantation. It is almost fully stocked. The chief undergrowth is composite herbs. Wild arrow root and Lantana also found.	The area was tuckled with ragi, 18 acres by Kurubars and 15 by Government agency. Cost of plantation excluding the revenue realised by ragi for the first year only Rs. 193–6–9. Tending done twice in 1935, thrice in 1936 and 1937 and 1938. Thinned in 1946–47.
Nellikere IV	**1936**	**4**	**31·00**	Slope—Moderate. Soil—Brownish black loam. Crop—The plantation is well stocked but apparently not so good as that of 1935–36. The main undergrowth is composite herbs.	The stump planting was done in early April, the earliest date attempted so far in this locality. The comparitively poor growth is possibly a result of this. Fifteen acres tuckled by Government agency and rest by Kurubars Lantana shoots were pulled up before the ragi was sown. Cost of plantation up to December 1936, Rs. 967–8–0. The revenue realised by ragi Rs. 1,015.
Nellikere V	**1937**	**4**	**26·00**	Stocking and height growth fairly satisfactory. Lantana not very dense. Wild arrowroot is commonly found as undergrowth. The plantation received three weedings in 1937, three in 1938 and one in 1939, 1940 and 1941.	Thinning was carried out in 1946–47.
Kargudy IV	**1938**	**2**	**19·00**	Stocking fairly good but the stems are low branched. Tending by way of climber cutting done in 1952.	Thinned during 1933–34.
Kargudy V	**1939**	**2**	**19·00**	Patches are suppressed by tall growth of elephant grass. The stems are low branched. Tending by way of climber cutting done in 1952. Three weedings each in 1939 and 1940, and two tendings from 1941 to 1943 and one in 1944 and 1946 were carried out.	Fire occurred in 1944–45 and 1948–49. No thinning so far done (1952).
Kargudy VI	**1940**	2	**21·00**	Crop has fairly good stocking. The undergrowth is mostly wild arrowroot. Tending in the way of climber cutting done in 1952. Three weedings were done in each of the years 1940 and 1941. Two tendings were done in 1942 and one each in 1943 and 1946.	There were fires during 1944–45 and 1948–49. No thinning so far done (1952).
Kargudy VII	1941	**2**	**19·00**	Stocking fairly good. Lantana is invading the area. Climbers are common. Two weedings were done in 1941, one tending in 1944, two in 1945 and one in 1946 and 1952.	There were fires during 1944–45 and 1948–49. No thinning so far done (1952).

Name of plantation. (1)	*Year of planting.* (2)	*Compartment number.* (3)	*Area in acres.* (4)	*Details.* (5)	*Remarks.* (6)
Kargudy VIII	1941	1	15·00	Along the Mysore Road the growth is fairly satisfactory. One half of the area (on the upper side) the growth is poor. Climbers common. Two weedings were done in 1941 and 1942. Two tendings were done in 1942 and one in 1943.	There were fires during 1944-45 and 1948-49. No thinning so far done.
Teppakadu II	1941	9	17·00	Fairly uniform growth is present. But the height growth for its age is not satisfactory. Lantana is found more in the top portion. Three tendings were done in 1942, one in 1944, two in 1945 and one in 1948. Climber cutting was done in 1952.	The area was accidentally burnt in 1944-45. A thinning had been done in 1948-49.
Kargudy IX	1942	2	17·00	There are many Lantana and Eupatorium patches. Climbers are common. Stocking moderately good. Two weedings done in 1942, one tending in 1943 and 1944 and two in 1945.	No thinning yet done (1952) There were fires during 1944-45 and 1948-49.
Kargudy X	1942	2	31·00	A poor plantation. There is a thick mass of elephant grass all over the area. The teak stems are stunted and branchy. The soil tends to be swampy in patches.	....
Ombetta I	1942	19	21·00	Stocking and height growth fairly satisfactory. Lantana, Eupatorium and elephant grass found. Weedings were done in 1942 and 1943, twice, and tendings in 1944 to 1946 and 1952.	There were fires in this plantation during 1948-49 and 1950-51.
Cheenakolly VIII ..	1943	6	11·00	Stocking is satisfactory. Lantana is abundant and badly interfering with the growth of teak. Three weedings were done in 1943, two tendings in 1944 and one each from 1945 to 1947.	No thinning yet done (1952). There were fires in this plantation during 1948-49 and 1950-51.
Ombetta II	1943	19	21·00	The rate of growth is poor. Elephant grass common. Damage by elephants had been severe and hence many stems had been cut back to give straight coppice growth. Weedings done twice from 1943 to 1945 and tending annually from 1946 and 1947.	There were fires in the plantations during 1948-49 and 1950-51.
Ombetta III	1943	18	21·00	Growth is faily satisfactory. Lantana and elephant grass noticed. Two weedings were done in 1943, three in 1944 and two tendings were carried out in 1945 and one each during 1946 and 1947.	Do.
Ombetta IV	1944	18	38·00	The teak had grown up fairly satisfactorily. Lantana and elephant grass are found. Two weedings were done in each of the years 1944, 1945 and 1946 and one tending in 1947.	Do.
Ombetta V	1944	19	18·20	The growth is poor. Besides elephant grass, there is the invasion of Lantana and Eupatorium. The teak is heavily branched. There are many coppice regrowths due to cutting back after elephant damage or fire. Two weedings were done annually from 1944 to 1946. One tending was done in 1947.	Do.
Ombetta VI	1948	20	22·00	The growth is poor. Lantana had invaded heavily. A struggle between the teak and the lantana is taking place. Two weedings were done in 1948 and 1949. Tending was done in 1951 and 1952.	The area was completely burnt in 1948-49. About 8 acres burnt in 1950-51.
Bidhurhalla II	1949	3	23·50	Instead of the usual espacement of 6 feet × 6 feet teak was raised at $8\frac{1}{2}$ feet × $8\frac{1}{2}$ feet with the result that lantana had taken possession of the area more heavily than usual. The teak plants are in a smothered state in the vast stretch of wilderness of Lantana. In this area tuckle crop of ragi was raised. Three weedings in 1951 and one tending in 1952 were carried out.	....
Bidhurhalla III	1950	3	25·00	This was also raised at an espacement of $8\frac{1}{2}$ feet × $8\frac{1}{2}$ feet. The state of affairs is comparable with the plantation described immediately above.	....

Name of plantation. (1)	Year of planting. (2)	Compartment number. (3)	Area in acres. (4)	Details. (5)	Remarks. (6)
Bidhurhalla IV	1951	3	25·50	This was also raised at an espacement of $8\frac{1}{2}$ feet × $8\frac{1}{2}$ feet with similar results as the plantation referred to above. The area is being tended.	....
Bidurhalla V	1952	3	18·10	The plantation was raised by planting the stumps at 6 feet × 6 feet. The bitter lesson learnt by adopting a wider espacement for poor quality site made the reversion to the old espacement. The plantation had been tended properly.	....
Ombetta VII	1952	19	25·25	Do.	....
Bidurhalla VIII	1953	3	22·25	The stumps were planted at 6 feet × 6 feet. They have just sprouted. (1953 May.)	....

APPENDIX XVI.

List of common Forest Flora in the Nilgiris Division.

Botanical name. (1)	Kanarese name. (2)	Tamil name. (3)
Abrus precatorius	Guluganji	Kunrumani.
Acacia concinna	Chunika	Seyakai.
Acacia dealbata	....	Simavelampattai.
Acacia decurrens	....	Simavelampattai.
Acacia ferruginea	Banni	Vanni.
Acacia intsia	Cheenge	Vellindu.
Acacia leucophloea	Nayibela	Velue.
Acacia melanoxylon		....
Acacia pennata	Nayisigae	Singaimullu.
		Kaducheenge.
Acacia sundra		Karungali.
Acalypha fruticosa	Chigari	Cinni.
Adhatoda vasica		Adadodai.
Adina cordifolia	Cadambu	Manja Kadambai.
Aegle marmelos		Vilgam.
Agave americana	Bhuthala	....
Ailanthus excelsa	Peethirai	Pimaram.
Albizzia amara	Sujjal	Sujjil, usil.
Albizzia lebbek	Vagai	Vagai.
Albizzia odoratissima	Karivage	Karuvagai.
Albizzia procera		Velvagai.
		Thelani.
Albizzia stipulata	....	Silaivagai.
Allophylus cobbe	....	Perrakudikai.
Aloe officinalis	....	....
Alsionia scholaris	....	Hala (N).
Amoora rohituka	....	....
Anogeissus latifolia	Bijjalu Dinduga	Namai.
		Vekkali.
Anona squamosa	....	....
Antidesma diandrum	....	....
Ardisia humilis	....	Kalaka.
Argyreia cuneata	....	....
Artocarpus integrifolia	Chakke	Pila.
Artocarpus hirsuta	Ane. Hebbalasu	Iri.
Asparagus racemosus	....	Sooral.
		Itla, Agale.
Atalantia monophylla	Kat-imbin	Kattelumi chai.
Azadirachta indica	Bevinamara	Veppu.
Balsamodendron berryi	Tzhatai	Kiluvai.
		Kattukiluvai.
		Malan-kiluvai.
Bambusa arundinacea	Hebbidiru	Peruvarai.
		Perumungil.
Barleria buxifolic	....	

Botanical name. (1)	Kanarese name. (2)	Tamil name. (3)
Bassia latifolia	Alippa	Kattu Iluppe.
Bauhinia racemosa	....	Athimaram.
Bauhinia malabarica	Kadu Kodangai	....
Berberis asritata	....	Mullukala.
Berberis tinctoria	....	Jekkale.
Bischofla javanica	Nirli, Nellu	Neele.
Bombax malabaricum	Poola	Ilavan.
Borassus flabelliformis	Byne	Panai.
Boswellia serrata	Dhupadamara	Kungiliam.
Bridelia retusa	Goju	Mullvengai.
		Komangi.
Buchanania latifolia	Cheru	Kattuma-cherai.
		Murekulu.
Bucklandia populnea	....	....
Butea frondosa	Muthan	Palasu.
		Kattumuruku.
Butea superba	Pothangi	....
Caesalpinia bonducella	....	Kalakodi.
Cajanus indicus	....	....
Calamus rotang	....	....
Callicarpa lanata	Moran	Karumpattaichedu.
Callitris rhomboidea	....	....
Calotropis gigantea	Ekka	Erukkam.
Canarium strictum	....	....
Canthium didymum	Pyre	Terani.
		Nekkani.
Canthium parviflorum	Kare	Angarai.
Capparis grandiflora	....	Turattumulla.
Cardamomum officinale	....	....
Cordiosperumum halicacabum	....	....
Careya arboreia	Kaval	Kavana.
Carica papaya	....	Pappai.
Carissa carandas	Kawligidu	Kala.
Carissa spinarum	....	Sirukala.
Casearia tometosa	....	....
Cassia auriculata	....	Avaram.
Cassia fistula	Konna	Konnai.
Cassia tomentosa	....	Katt-avarai.
Cassia tora	....	Tagarai.
Casuarina suberosa	....	....
Cedrela toona	Kalkilingi	Kattil.
Celtis tetrandra	....	Aduva, Karike.
Celtis wightii	....	Aduva, Hadawa.
Chloroxylon swietenia	....	Porasu.
Chukrassia tabularis	....	Kalkilingi.
Cinchona	....	....
Cinnamomum zeylanicum	....	Sannalavangapattai.
		Orala Maddu.
Cipadessa fruticosa	....	Sannaturukavembu.
Citrus aurantium	Madaranaranga	....
Citrus medica	Cheriya naranga	....
Clausena wildenovii	....	Kattukaruvepillai.
Cleistanthus collinus	....	....
Cocholospermum gossypium	....	Kattuparrutti.
Coffea arabica	....	Kapi.
Cordia myxa	....	Naruvilli.
Cordia monoica	....	....
Cotoneaster buxifolia	....	....
Crataeva religiosa	....	....
Cryptomeria japonica	....	....
Cupressus lawsoniana	....	....
Cupressus torulosa	....	....
Doemia extensa	....	....
Dalbergia latifolia	Veeti	Itti.
Dalbergia paniculata	....	Pachalaimaram.
		Belugimaram.
Daphniphyllum glaucescens	....	Nirkakke.
		Kemmoni.
Dautura	....	....
Dendrocalamus strictus	Kiribidiru	Sirubarai.
		Sirumungil.
Derris scandens	....	....
Desmodium pulchellum	....	....

Botanical name. (1)	Kanarese name. (2)	Tamil name. (3)
Dichopsis elliptica	Pali	....
Dichrostachys cinerea	....	Vidathalai.
Dioscorea	....	....
Diospyros montana	Kallukuthemara	Vakkanai.
Dodonaea viscosa	....	Velari.
Ehretia buxifolia	....	....
Elaeagnus kologa	....	Korangu.
Eloecarpus munroii	Kalbikki.	....
Eloeocarpus oblongus	Bikki	....
Eloeocarpus tuberculatus	Thodavan	....
Eloeodendron glaucum	Malemari	Silupilanmaram.
Erioloena quinquelocularis	Gamsi Pacharig	....
Erythrina indica	Murukku	Kallyanamurukku.
Erythrina lithosperma	....	Sembulicham.
Eucalyptus acmenoides	....	....
Eucalyptus amygdalina	....	....
Eucalyptus calophylla	....	....
Eucalyptus crebra	....	....
Eucalyptus eugenioides	....	....
Eucalyptus globulus	....	Karupuram.
Eucalyptus gunnii	....	....
Eucalyptus hemiphloea	....	....
Eucalyptus paniculata	....	....
Eucalyptus pilularis	....	....
Eucalyptus punctata	....	....
Eugenia arnottiana	....	Nage. Aiyri.
Eugenia calophyllifolia	....	Kurnainanel.
Eugenia jambolana	Neril	Nage. Nerale.
Eugenia montana	....	Peereralu
Eupatorium	....	....
Euphorbia antiquorum	....	Kalli.
Euphorbia tirucalli	....	....
Eurya japonica	Hooluni	Aruthuvarai.
Evodia lunar-ankenda	....	....
Evodia roxburghiana	Konula	....
Feronia elephantum	....	Vilamaram.
Ficus bengalensis	....	Aal. Sel.
Ficus glomerata	....	Atti.
Ficus hispida	....	Paragu.
Ficus religiosa	....	Arayallu.
Ficus tajakela	....	Chela.
Filicium decipiens	....	....
Garcinia cambogia	Korugapuli	....
Gardenia turgida	....	Handisan.
Garuga pinnata	Bale	....
Gaultheria fragrantissima	....	Moolai.
Givotia rottleriforms	....	....
Glochidion neilgherrense	....	Hanake. Hanikei.
Glochidion valutinum	....	Vaigai.
Glycosmis pentaphylla	Erpoorti	....
Gmelina arborea	Kumil	Kumala. Chella.
Gmelina asiatica	....	Nilakumil.
Gordonia obtusa	Naida	....
Grevillea robusta	....	Soraki.
Grewia asiatica	....	Kallaimolai.
Grewia tiliaefolia	Thadachi	Thadasu.
Gymnosporia ovatu	....	Kattangi.
Gyrocarpus jacquini	....	Thanakku.
Hakea	....	....
Hardwickia binata	....	Aachan.
Hedyotis stylosa	....	Mullai.
Helicteres isora	Kowri	Valamburi.
Hemidesmus indicus	Magaliberu	Nannari.
Heptapleurum wallichianum	....	....
Hevea	....	....
Heynea trijuga	Cendarai	....
Hibiscus rosasinensis	Kembathi	....

Botanical name. (1)	Kanarese name. (2)	Tamil name. (3)
Holarrhena antidysenterica	....	....
Holoptelea integrifolia	....	Aya.
Hydnocarpus alpina	Totti	Maratotti.
Hydrocarpus wightiana	Neerbitti	....
Hypericum mysorense	....	Onnai.
Ilex denticulata	Etherulu	....
Ilex wightiana	Vellodai	....
Ixora notoniana	....	Hulloni.
Jasminum	....	Malli.
Jasminum angustifolium	....	Kattumalli.
Jatropha curcas	....	Halumara.
Kydia calycina	Bende	Vendai.
Lagerstroemia lanceolata	Bellandi	Vendekku.
Lantana camara	....	Roja.
Lantana indica	....	Chulli.
Lasiosiphon	....	....
Lawsonia alba	....	Marudonri.
Leucas aspera	....	Thumb.
Leucas rosmarinifolia	....	Sannatumbai.
Ligistrum neilgherrense	....	Koli.
Ligistrum roxburghii	....	Koli.
Limonia acidissima	Nallumichai	Magavilvam.
		Narinaranga.
Linociera	....	....
Litsaea tomentosa	....	Karike.
		Thudai.
Litsaea zeylanica	....	....
Loranthus	....	Barada.
Macaranga indica	....	....
Macaranga roxburghi	....	....
Machilus maerantha	....	Kulirmavu.
		Neri.
Mallotus philippinensis	Pulith	Kamala.
		Kopila.
Mangifera indica	Mavu	Mamaram.
Mappia foetida	....	....
Melia azadirachta	....	....
Melia composita	....	Malaivembu.
Melia dubia	....	....
Meliosma arnottiana	Hulimogge	Hulimukkai.
Meliosma wightii	Thude	....
Memecylon edule	....	Kaledale.
Mesua ferrea	....	Suruli.
Michelia champaca	Sambaka	Chembaka.
Michelia nilagirica	....	Nilgiris Chembakam.
Microtropis ovealifolia	....	Bollodai.
Mimosa pudica	....	Thottavadi.
Mimusops elengi	....	....
Moringa pterygosperma	..	....
Murraya exotica	....	....
Mussaenda	....	....
Myristica fragrans	....	Jatika.
Myrisine capitellata	....	Kokile.
Myrsine wightina	....	Kokkil.
Ocimum sanctum	....	Thulasi.
Odina cordifolia	....	Mojakadambai.
Odina wodier	....	Udimaram.
		Godda.
Olea dioica	....	Edale.
Olea glandulifera	Kundu	Kunalar.
		Kundai.
Opuntia dillenii	....	Sappatikalli.
Ougeinta dalbergioides	....	Kulluvengai.
Pavetta breviflora	....	Therena.
Phoebe wightii	....	....
Phoenix sylvestris	....	Escha.
Photinia lindleyana	....	Kodibikki.
Photinia notoiana	....	Kodibikki.
Phyllanthus emblica	Nelli	Nellikai.
Pinus longifolia	....	....
Piper longum	Kattukarumilogu	Kadumensau.
Pittosporum nilghirense	Kuyimavan	....
Polyalthia cerasoides	....	....

Botanical name. (1)	Kanarese name. (2)	Tamil name. (3)
Pongamia glabra	Ponga	Pungam.
Premna tomentosa	....	Kolakattaitekku.
Prosopis spicigera	....	....
Protium caudatum	....	....
Psidium guyava	....	Koyya.
Psychotria elongata	....	Therena.
Pterocarpus marsupium	Vengai	Vengi.
Pterolobium indicum	....	....
Pterospermum rubigonosum	Perug	....
Randia dumetorum	....	Karai.
Rhododendron nilagiricum	....	Billi.
Rhodomyrtus tomentosa	....	Tavittu Koyya.
		Thavattai.
Rhus mysorensis	....	....
Ricinus communis	....	....
Rubus lasiocarpus	....	....
Ruta graveolens	Pambukolli	Aruvadan.
Salix tetrasperma	Mayya	....
Santalum album	Gandha	Sandanam.
		Chandana.
Sapindus emargianat	....	....
Sapindus trifoliatus	....	Poochakottai.
Schefflera racemosa	....	Yegalu.
Schleichera trijuga	Segade	Poormaram.
Schrebra swietenioides	Kallgante.	....
Scutia indica	....	Kokkumullu.
		Katharigamulai.
Semecarpus anacrdium	....	Serangottai.
Shorea talura	Jala	....
Solanum giganteum	....	Peysundai.
Solanum indicum	....	Pinjarak.
Solanum-verbaschfolium	....	Chunde.
Spatholobus roxburghii	....	....
Spondias mangifera	....	....
Stephegyne parvifolia	....	Nirkadambai.
Sterculia urens	Puttamara	....
Sterculia villosu	Shage	....
Stereospermum chelonoides	....	Padri.
Strobilanthus foliosus	....	Kurinichi.
Strobilanthus kunthianus	....	Kattai.
Strychonos nux vomica	....	Etti.
Strychonos potadorum	....	Tethangottai.
Swietenia macrophylla	....	Mahagany.
Symplcos foliosa	....	Buthakanni.
Symplcos spicata	....	Buduganne.
Tamarindus indica	Hali	Pulyamaram.
Tectona grandis	....	Tekku.
Terminalia arjuna	....	Nirmathi.
Terminalia belerica	....	Thani.
Terminalia chebula	Kaduka	Kadukoi.
Terminalia paniculata	....	Poomarudu.
Terminalia tomentosa	Mathi	....
Ternstroemia japonica	Kemuri	....
Toddalia aculeata	....	Kattunilagu.
Toddalia asiatica	..	....
Trema orientalis	....	Omai.
		Amai.
Turpinia pomifera	Nila	Nila.
Vaccinium leschenaultti	....	Kala.
		Malaikalu.
		Andula.
Vaccinium nilgherrense	....	Kala.
Ventilago madraspatana	....	Curulpattaikodivembadam.
Vernonia	....	....
Viburnum acuminaium	....	Pooka.
		Thambitta.
Viburnum hebanthum	....	Kadambu.
Vitax altissima	Nooler	Mayilladi.
		Mylla.
Vitex negundo	....	Nochi.
Vitis quadrangularis	....	Pirandai.

Botanical name. (1)	Kanarese name. (2)	Tamil name. (3)
Webera corymbosa	....	Pavattai.
Wendlandia notoniana	....	Therena. Anche.
Wrightia tinctoria	....	Thurittilu. Palai.
Zingiber officinale	....	....
Zizyphus jujuba	....	Ilandai.
Zizyphus oenoplia	....	Curaikodi.
Zizyphus rugosa	Chotte	Kattlelandai.
Zizyphus trinervia	....	Karukattam.
Zizyphus xylopyrus	....	Kottai.

APPENDIX XVII.

List of maps prepared for this Working Plan.

1. Key Map showing the distributions of the various ranges and the different Working Circles. (Scale 1 inch = 2 miles), 1 sheet.

2. Map of Eucalyptus and other plantations included in the Blue Gum Working Circle. (Scale 8 inches = 1 mile, mostly), 4 sheets.

3. Map of Pyrethrum fields included in the Pyrethrum Working Circle. (Scale 16 inches = 1 mile), 2 sheets.

4. Map of Wattle areas included in the Wattle Working Circle. (Scale 8 inches = 1 mile), 1 sheet. (Scale 2 inches = 1 mile), 2 sheets.

5. Detailed stock maps of the four blocks in Mudumalai Range. (4 inches = 1 mile), 4 sheets.

6. Map of Teak plantations (showing their quality class) and areas included for conversion under the Teak Working Circle. (Scale 4 inches = 1 mile), 1 sheet.

7. Map of areas included in the Sandal Wood Working Circle. (Scale 2 inches = 1 mile), 6 sheets.

8. Map of areas included in the Bamboo Working Circle. (Scale 2 inches = 1 mile), 1 sheet.

9. Kundah Grazing Map. (Scale 1 inch = 1 mile), 1 sheet.

10. Maps showing the blocks for afforestation in the Wenlock Downs and in the Kundahs. (Scale 2 inches = 1 mile), 2 sheets.

Proceedings of the Chief Conservator of Forests, Madras.

Proceedings Mis. No. 660, 20th November 1953

Working Plan—Nilgiris Forest Division—Sanctioned.

Sri V. V. Subramanian, I.C.S.,
Chief Conservator of Forests.

Proceedings—Mis. No. 660, dated 20th November 1953.

Sanctioned.

V. V. Subramanian,
Chief Conservator of Forests.

(True copy)

Personal Assistant.

To the Conservator of Forests, Working Plans Circle.
" Conservator of Forests, Ootacamund Circle.
" District Forest Officer, Nilgiris.